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ABSTRACT

An initial study with 30 students in clinical speech pathology training found videotape confrontation to be a powerful clinical training technique. This subsequent study, using 20 additional students, was designed to compare the effectiveness of audiotape and videotape, and to ascertain whether videotape self-confrontation (single and double confrontation) increased self-awareness and insights into use of operant methodologies. The study also evaluated a previously developed therapy analysis matrix as a tool in evaluating audiotape confrontation. The results of the investigation suggest that both audiotape and videotape are effective procedures for training speech therapists, that audiotape confrontation when combined with behavioral scoring is as effective as videotape confrontation in changing verbal behavior, and that the therapy analysis matrix appears to be a useful tool in evaluating the taped therapy sessions. A bibliography is appended, as well as additional material concerning the research methodology. (JY)

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FINAL REPORT

Project No. ~~1381~~ 7-1318
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THE DEVELOPMENT OF CLINICAL SKILLS IN SPEECH PATHOLOGY BY AUDIOTAPE AND VIDEOTAPE SELF-CONFRONTATION

Daniel R. Boone, Ph. D., Project Director
Ernest L. Stech, Ph. D., Project Coordinator

Speech and Hearing Center
University of Denver
Denver, Colorado 80210

June 15, 1970

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TITLE: The Development of Clinical Skills in Speech Pathology by Audiotape and Videotape Self-Confrontation

INVESTIGATOR(S)Daniel R.Boone & Ernest L. Stech

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SUMMARY OF REVIEWS

This report describes the second stage of a project which has been investigating methods to improve clinical training programs for student speech pathologists. The project was originally funded as "An Experimental Study of the Clinical Acquisition of Behavioral Principles by Video-tape Self-Confrontation." Prior to the termination of the grant, a one year continuation request was submitted, and approved, to investigate the relative effectiveness of two training conditions. The report has been reviewed by two consultants, one field reader, one in-house reader and Division of Research staff and received four recommendations of approval and one provisional approval. On the basis of these reviews we are recommending approval and submission to the ERIC system.

Consistency with Proposal

The activities reported indicated the project was conducted as proposed. The population was smaller than planned (N = 20, vs. N = 30) since a number of clinicians had been subjects in the prior study and the investigators decided not to use them. Sample size was still acceptable.

Technical Soundness

Population and sampling procedures were felt to be appropriate to the study. The design was a simple randomized one and statistical tests were appropriate to the data. It was noted that this project, and others of its type, could benefit from more precise and refined instruments for measuring self-concept and behavioral changes. The probability of confounding audio confrontation with effects of video as a result of graduate student interaction was mentioned and it was suggested that the effects of differential treatment may have been lost due to group interaction. This possibility was not discussed by the authors and although it might not have been possible to control for such factors, it may have been possible to study the phenomenon. These criticisms, while useful as warnings to future researchers, did not indicate serious weaknesses in the technical soundness of the project.

Adequacy of Reporting

The rationale for the study, related research are presented and the author related his discussion back to the rationale. The report is detailed and gives the reader a complete picture of the study. The writing style tends to be "stilted" and the report is difficult to read and understand in certain sections. The reporting of procedures, results and conclusions is adequate.

Educational Significance

Readers were not in agreement about the significance of the project. Reactions ranged from "the educational significance of this project is exciting" to "the problem under investigation was not particularly exciting." The dissenting reviewer indicated the results were obvious and suggested that an assessment of direct supervision contrasted with the video-tape systems would have been a better subject for research. Generally readers felt the report and methodology would be valuable to the field.

Technical Quality

The report is technically adequate; the authors conformed with the required format and organization of the report. The project number on the cover and title page was inaccurate. Mistyped (or misspelled) words were evident in the report and the editing could have been improved. Reproduction was good..

*$ABSTRACT
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@SUMMARY
THIS INVESTIGATION WILL HAVE TWO PHASES. PHASE I WILL BE DEVOTED TO TH DEVELOPMENT OF VIDEOTAPE SELF-CONFRONTATION METHODOLOGIES. IN ADDITION DURING PHASE I, TRAINEES WILL BE INSTRUCTED IN THE BEHAVIORAL PRINCIPLE TO BE EMPLOYED IN THEIR SUBSEQUENT CLINICAL TRAINING SESSIONS. IN PHASE II THE INVESTIGATORS WILL TEST EXPERIMENTALLY THE RELATIVE EFFECTIVENESS OF THREE TRAINING CONDITIONS (1) A STANDARD CONDITION I WHICH TRAINEES ARE SUPERVISED IN A TRADITIONAL MANNER WITH NO SELF-CONFRONTATION EXPERIENCE, (2) A SINGLE-CONFRONTATION CONDITION IN WHICH TRAINEES OBSERVE THEMSELVES ON VIDEOTAPE AND EVALUATE THEIR USE O BEHAVIORAL PRINCIPLES WITH A TRAINER, AND (3) A DOUBLE-CONFRONTATION EXPERIENCE IN WHICH TRAINEES HAVE THE SAME EXPERIENCE AS THE SINGLE-CONFRONTATION SUBJECTS, AND, IN ADDITION, CONFRONT THEMSELVES CONFRONTING THEMSELVES. THE EFFECTS OF THESE THREE TRAINING CONDITIONS WILL BE DETERMINED BY USE OF QUESTIONNAIRES, Q-SORTS, INTERVIEWS, THE COUNTING OF EFFECTIVE BEHAVIORAL REINFORCEMENTS, AND OTHER MEASURES.

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FINAL REPORT

Project No. ~~138~~ 7-1318
Grant No. OEG-9-071318-2814

THE DEVELOPMENT OF CLINICAL SKILLS IN SPEECH PATHOLOGY BY AUDIOTAPE AND VIDEOTAPE SELF-CONFRONTATION

Daniel R. Boone, Ph. D., Project Director
Ernest L. Stech, Ph. D., Project Coordinator

Speech and Hearing Center
University of Denver
Denver, Colorado 80210

June 15, 1969

The research reported herein was performed pursuant to grant with the Office of Education, U. S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

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SUMMARY

In the year previous to this present project year the investigators developed methodologies for studying speech and hearing therapy, employing a therapy analysis matrix to use with videotape self-confrontation. Initial study with 30 students in clinical speech pathology training at the University of Denver found videotape confrontation to be a powerful clinical training technique. In this second year 20 additional student speech and hearing clinicians were studied on the relative effectiveness of using audiotape and videotape confrontation as clinical training devices. These particular project questions were answered:

1. Are videotape self-confrontation (single and double confrontation) procedures practical and efficient methods of improving the self-awareness of developing speech clinicians?

2. Does the dissection of therapy segments through self-confrontation provide the student clinician insights into better use of operant methodologies in his therapy, as compared to conventional methods of developing these skills?

3. Is audiotape as effective as videotape for studying both oneself and what one does in therapy?

4. Can supervisors be trained to employ videotape derived matrices developed in the first year of the project and employ them as supervisors with student clinicians?

All 20 subjects were tested on the same dependent measures before the confrontation began and after it was completed. Ten subjects were then assigned to the audiotape confrontation group. Each of these audio subjects listened to segments of their taped therapy sessions, scoring their therapy segments as they listened to them. Ten subjects were assigned to the videotape confrontation group. Each of these video subjects listened to and watched videotape playbacks of their speech therapy sessions, employing the same therapy analysis procedures as the audiogroup.

Each subject was tested in the beginning of the project year specific to his formal knowledge and application of behavioral modification principles. Significant shifts were found among all subjects in their knowledge of and attitude toward behavioral concepts which were tested in pre- and post-experiment testing. Subjects demonstrated, almost from the beginning, an accurate awareness of their application of both positive and negative reinforcement in therapy. There were no significant changes in amount of positive reinforcement given over an eight week period by both audiotape and videotape subjects. A markedly significant (.001 level) change was seen in the increased use of negative

reinforcers (punishment) used by both group subjects. It would appear that as a clinician develops more clinical self-awareness and clinical competence, he increases the use of punishment within therapy.

In comparing audiotape to videotape confrontation, the results showed that both modes of self-confrontation were effective in changing the verbal behaviors of the student clinician. While audiotape appears equally effective in identifying verbal behaviors in therapy, it is obviously lacking in its ability to identify clinician and client non-verbal behaviors (head shaking, gestures, expressions, etc.). The therapy matrix designed for use in this study with videotape confrontation was found to be equally applicable when used with audiotape confrontation; most of the behaviors in speech therapy are verbal and, therefore, the sequence of most events in therapy can well be identified by using audiotape.

The findings of this study, when coupled with the practical application of both audiotape and videotape confrontation, clearly indicate that such confrontation procedures lend themselves well to the training of speech and hearing clinicians. When using the therapy analysis matrix during confrontation, the clinician appears to develop accurate insights relative to his function as a person and his demonstrated capability as a clinician. As a result of two years of investigation using both audiotape and videotape in clinical training, the investigators are now preparing dissemination information specific to application of confrontation techniques by preparing a book on supervision training and developing workbooks for both audiotape and videotape self-confrontation. Developed procedures may well have relevance and practical application, also, for the training of teachers, clinical psychologists, remediation therapists, and special educators.

INTRODUCTION

The clinical training of speech and hearing clinicians is generally deferred in most training programs until the graduate years. At this graduate period the student clinician is exposed in a relatively brief time to the various practicum aspects of clinical work. The graduate clinician combines lecture and demonstration experience with observation and supervised therapy as he seeks to develop a professional clinical competence. The typical kind of supervision provided most graduate students in clinical training is direct observation by the supervisor, followed by counseling specific to the therapy situation. More recently, videotape has been added to the clinical training process wherein a therapy session is taped and later reviewed by student clinician and supervisor.

In the past several years, with the support of Division of Research, BEH-OE funding, various faculty members of the University of Denver have been studying videotaped self-confrontation (VTR) as a clinical training device, finding it to be an attractive and effective training tool. Using VTR, it has been possible to teach students a method of analyzing their own therapy sessions, with or without supervision. The advantages of using videotape over live observation have been found to be: immediate and continuing re-usable playback, clear pictures with natural lighting, instant correction by retaping, portability of equipment, stop-framing capability, preservation of the therapy session as long as needed, etc. By using VTR, student speech and hearing clinicians were able to view critically their own therapy session, looking at the interaction of their behaviors as a clinician with the behaviors of the client in therapy. Analysis of videotape playbacks clearly demonstrated that what goes on in therapy is the result of behavioral consequences (cause and effect) of the behavior of both clinician and client. That is, a typical therapy sequence might begin by clinician modeling, client responding correctly, with clinician then positively reinforcing the client's correct response, perhaps resulting in a subsequent increase in correct response by the client. Whatever the sequence of therapy events, by using videotape self-confrontation, it was possible to identify clearly these events.

While the original research proposal in studying videotape confrontation focused on the clinicians using operant principles in therapy, it soon became evident that the method of taping therapy and its immediate or later study of what went on in therapy was easily applicable to any philosophical system of therapy (operant, analytic, non-directive, instructional, etc.). Experience in using videotape with student clinicians led the experimenters to believe that, while the video portion of the playback was useful, there was much information about the therapy session available in the audio playback. The question then developed: could audiotape self-confrontation (ATR) be as effective in clinical training as videotape self-confrontation (VTR) had been found to be?

Because of the relative scarcity and expense of video equipment as compared with audio equipment, this question of possible audiotape utilization presented an obvious area of inquiry.

The previous year of research using videotape self-confrontation (Boone and Goldberg, 1969) led the investigators to some optimistic formulations for the use of these methods in the clinical training of speech and hearing clinicians. These formulations were then coupled to the question of using, also, audiotape as a self-confrontation tool. With this background the following questions were developed for the second year of this study:

1. Are videotape self-confrontation (single and double confrontation) procedures practical and efficient methods of improving the self-awareness of developing speech clinicians?

2. Does the dissection of therapy segments through self-confrontation provide the student clinician insights into better use of operant methodologies in his therapy as compared to conventional methods of developing these skills?

3. Is audiotape as effective as videotape for studying both oneself and what one does in therapy?

4. Can supervisors be trained to employ videotape derived matrices developed in the first year of the project as supervisors with student clinicians?

These questions and their answers, when combined with first year project results, summarize well the applicability potential of both audiotape and videotape confrontation as clinical training methodologies.

RELATED RESEARCH

Some research has been conducted comparing videotape confrontation and feedback to audiotape, verbal critique, or other techniques. Audiotape has been used in training in many areas where professional behavior involves interaction between two people. Korner and Brown (1952) and Anderson and Brown (1955) describe procedures for using audiotape playback in teaching counseling skills. Stimulated recall methods (Bloom, 1950; Bloom, 1953; and Bloom and Broder, 1950) have been reported also. Many teachers of public speaking have used tape recorders to give students feedback, and many speakers practice by recording their speeches. Yet hard research data is not available on the efficacy of such procedures.

Holzman and Rousey (1966) reported the results of a research study on the voice as a percept. When subjects were confronted with audiotape recordings of their own voices, they tended to be more affective and evaluational than control group subjects. The authors hypothesized that through audiotape playback the voice becomes a percept rather than a mediator of expression. In that experience the speaker hears the result of his inner formulation and censoring processes but also hears some of the things he thought he was censoring. The speaker finds himself more self-revealing than he had anticipated, and the self-revelation is the source of disturbance most people feel when they hear themselves.

Holzman, Rousey, and Snyder (1966) found, in a later study, that Ss listening to their own voices showed a greater physiological activation and a constriction in free association. The physiological activation finding was replicated when the recorded segment was played back three months later.

As a behavior or skill training technique, audiotape playback has been most widely used in teaching foreign languages. The language laboratory technique consists of having students tape record and then listen to their foreign language performance (Carroll, 1963; Borglum, 1958; Borglum and Mueller, 1956; Hoge, 1959). Peckrel, Neidt, and Gibson (1958) found that the language laboratory made it possible for the instructor without training in a particular language to teach the language effectively.

A direct comparison of videotape to audiotape has been made by Stroh (1969), who trained salesmen to talk less and ask questions more. Both the video and audio groups shifted significantly after two confront sessions. There was a large difference between the two groups initially with the video group allowing much more customer talk; however, after training, the customer talk for both groups had increased and was virtually the same for both groups. In addition, the variability in performance of both groups was reduced with no significant difference between groups.

Haines and Eachus (1965) compared videotape to a verbal critique method in training military assistance advisers in cross-cultural skills. They found no difference in the degree of behavior change nor the time to change between the two conditions. There was a slight trend toward more change in nonverbal behaviors for the videotape group, but the results were not statistically significant.

Finally, Kallenback and Gall (1969) conducted research on videotape versus verbal supervision where the videotape was used in conjunction with the micro-teaching technique. There was no significant difference between the groups on final behavioral measures. However, the authors concluded that the videotape plus micro-teaching method was superior to conventional practice teaching and supervision, because it required much less trainer, supervisor, and administrator effort to get the same results.

No research has been reported on the motivational effect of videotape as opposed to standard supervision or audiotape confrontation. It seems probable that videotape viewing would sustain interest over a longer period than would verbal critiques or audiotape playback, but that hypothesis has yet to be tested.

There is also a lack of research on self-concept change under audiotape confrontation conditions. The Holzman and Rousey (1966) and Holzman, Rousey, and Snyder (1966) studies would tend to indicate the possibility of self-concept change as a result of hearing one's own voice, but there are no studies reported which deal directly with this issue.

In the realm of videotape confrontation, Braucht (1969) has shown that the most potent effect of videotape confrontation with emotionally disturbed Ss is an improvement in self-perception accuracy where accuracy is defined as the discrepancy between self-ratings and ratings by others. Braucht found no significant shift in self-esteem or anxiety as a result of self-confrontation.

In Nielsen's study (1962) each subject watched himself during the playback of a filmed interview in which he defended his personal philosophy in the presence of an interviewer who deliberately challenged it. On the basis of observations, tape recordings, and films, Nielsen reported that self-confrontation forced subjects to revise self-concepts, often causing them to modify behavior. While the Nielsen study was extensive and systematic, it was not experimental, nor did it provide much insight into the effectiveness of self-confrontation as an educational tool.

Stoller (1950) used closed-circuit television and videotape to study self-confrontation in a clinical setting. Group therapy

sessions of mental patients with chronic disturbances were videotaped, and each patient was given the opportunity to view the tape. Stoller concluded that the combination of group therapy and self-confrontation resulted in a significant improvement in patient communication and physical appearance. Stoller's findings are impressive, but his failure to use controls make them highly tentative.

Moore, Chernell, and Maxwell (1964) videotaped a series of interviews with 80 psychotic patients. Half of the patients were given an opportunity to view themselves on TV playback immediately following each interview. The other half served as controls. The patients who confronted themselves showed significantly more improvement than those who did not. A later study by Moore, Chernell, and West (1965) also demonstrated that VTR self-confrontation was helpful in the treatment of psychotics. Boyd and Sisney (1967) predicted on the basis of dissonance theory that VTR self-confrontation would produce a change in the self-concept of psychotic patients. Research by Danet (1968) into the use of VTR self-confrontation with psychiatric patients was less encouraging. Danet found that a combination of self-confrontation and group therapy produced more negative self-evaluations than group therapy alone.

Indirect support for the value of VTR self-confrontation is provided by Miller (1962) and Ward and Bendak (1964) who found that photographic self-images had a significant influence on the behavior of psychiatric patients.

In summary, videotape self-confrontation has shown no statistically significant advantage over other training methods in terms of amount of behavior change. It has been shown to be more efficient than conventional supervision when combined with behaviorally sophisticated training methodologies such as micro-teaching. There is some reason to believe that it is more effective in a very obvious area: changes in nonverbal behavior. Based upon the research literature, there is no strong justification for the use of videotape over audiotape methods, but the motivational effect of videotape confrontation versus audiotape playback has not been tested. Conversely, various visual feedback methods still pictures, motion pictures, and videotapes have been shown to change self-concept, but there are no research studies to indicate whether or not audiotape confrontation changes the self-concept.

The literature pertaining to clinical training has stressed the need for upgrading the quality of that training (Halfond, 1964; Rees and Smith, 1967). Very little has been written relative to the methods for accomplishing this upgrading task. Accomplish-

ment of this upgrading process appears to be dependent, at least in part, upon the development of objective means for describing the therapy process. Numerous writers have attempted to accomplish this aim by developing category systems for quantifying clinical events (Carroll, 1967; Snyder, 1945; Dittman, 1952; Dibner, 1956; Rabow, 1965). While quantified information appears to have considerable value, the dynamic interaction between persons is another area of valuable information. Attempts have been made to both quantify communication events and to describe the interaction between communicators (Bales, 1950; Barker and Wright, 1967; Amidon and Flanders, 1967). A major work aimed at describing the speech therapy communication setting was conducted by Johnson (1969). This work attempted to categorize speech therapy events utilizing a 40 category system, but low inter-judge reliability coefficients appeared to limit the effectiveness of this system.

Using an operant model as a method of looking at speech therapy, Boone and Goldberg (1969) studied the acquisition of behavioral principles by videotape self-confrontation. As part of this investigation Stech (1968) developed a 10 category behavioral category system for describing speech therapy sessions.

It appears that adequate description of the speech therapy process requires a descriptive system that demands a minimum of value judgments by the observer but is descriptive enough to detect the differences in the clinical process that may be the result of clinician bias, philosophy, or background as well as client differences.

Prescott (1970) expanded the Boone and Goldberg (1969) system in an attempt to meet the previously described aims. This study employed a procedure for timing clinical events and, consequently, allowed for making parametric statistical comparisons between subjects. High correlations between the timed clinical events and the tabulated number of clinical events supported the validity of the Boone and Goldberg technique of tabulating the number of clinical events. The results of the Prescott study indicated that the behavioral matrix developed provided a considerable and varied amount of descriptive information pertaining to the therapy sessions studied. High intra- and inter-judge reliability coefficients were demonstrated and the system appeared to be sensitive to clinician and client similarities and differences. This methodology appeared to have considerable value for future clinical training in speech and hearing therapy and for future study of the clinical process in this area.

METHODS

This videotape confrontation project was conceived as a second step in investigating ways to improve clinical training programs for student speech pathologists.* The study was conducted at the University of Denver Speech and Hearing Center, in which there are about 40 student clinicians at any one time actively involved in providing clinical speech service. The clinical training provided these students consists largely of lecture, demonstrations, and supervised practice. It was the hope of the investigators that by using audiotape and videotape self-confrontation, the students' overall clinical training program could be greatly enhanced.

The present project was devised as a supplementary training experience to be utilized in the already existing clinical training program and clinical facilities at the University of Denver. The experimental design using audiotape and videotape confrontation was developed consistent with the number of students available in clinical training and the type of supervision already used, and within the limitations imposed by an antiquated,obsolete clinical facility.

It was proposed in this research project that subjects would listen to audiotape or observe videotape playbacks of their behavior as clinicians. This self-confrontation experience,it was felt, would have a double effect on the student clinician: (1) it would help him to improve the accuracy of his perception of himself and (2) it would provide him with feedback relative to the effectiveness of his employment of clinical methodologies in his clinical sessions. In order to accomplish the experimental tasks, the project was divided into two distinct phases: Phase I and Phase II which will be discussed separately.

Phase I

The principal investigator, Daniel R. Boone, initiated the project on June 15, 1969. Arrangements included hiring Ernest L. Stech as videotape project coordinator on a full time basis. Dr. Stech had been a graduate research assistant on the project in the prior year. Mr. Thomas Prescott was retained as a graduate research assistant. Miss Florence Berman was hired as project technician with principal duties involved in operating the equipment, obtaining and reducing data, and assisting in the assignment and scheduling of subjects. Once personnel were hired, the project developed in these distinct areas: construction of instruments and appropriate questionnaires; development of operant instructions and demonstrations; development of audiotape confrontation procedures; and selection of two trainees to serve as pilot subjects during the Summer months of 1969.

* An Experimental Study of the Clinical Acquisition of Behavioral Principles of Videotape Self-Confrontation, supported by the Bureau of Education for the Handicapped, Office of Education.

Equipment.

The following items of equipment were available to this project: (1) two Ampex VR 7000 Videotape Recorders; (2) one Vidicon Camera, GE, with an Angenieux zoom lens, mounted on a dolly; (3) two television monitors were used (one was a 23 inch Setchel Carlson monitor which the subjects used to observe their own playback and the second monitor was a 9 inch Magnavox used exclusively as a taping monitor; (4) other clerical pieces of equipment (typewriter rental, storage cabinets, etc.) were available in the project office as required to facilitate total project needs.

Two offices, each approximately 11' x 11', were available for exclusive project use. The experimental room was outfitted with the large television playback monitor, a child's table with two small chairs, and a large table with two adult size chairs. A single microphone was attached to the ceiling. On the wall of the experimenter's office adjacent to the experimental room was a one-way mirror allowing the television camera to "shoot" its pictures without overtly interfering with the subjects or their clients. In the experimenter's office the two videotape recorders were housed on their appropriate platforms. The camera was mounted on its dolly so it could film through the open viewing port, constructed especially for this project. One corner of the room was devoted to the administrative aspects of the project, including a desk and chair. Two other chairs were placed in the office for project personnel.

Construction of Test Instruments and Appropriate Questionnaires.

A method for the rapid analysis of therapy sessions with the ten category learning theory system was devised (see Appendix A).

Most measuring devices employed in the present investigation were selected or designed specifically to meet the needs of this project. The following instruments were used during the project:

(a) The Denver Q-Sort. The investigators used a shortened 100 item Q-Sort, based on the 120 item sort from the previous year as presented in Appendix B. Each subject was asked to sort the Denver Q-Sort twice, to reflect his "actual" behavior as a clinician and, second, to reflect his "ideal". All subjects were administered the Denver Q-Sort at the beginning and at the end of the study.

(b) A Self-Perception Questionnaire. A questionnaire of the semantic differential type was developed by the investigators to determine how each experimental subject felt about himself after observing himself on videotape. It asked the subjects to rate particular qualities such as "pleasant-unpleasant", "friendly-unfriendly" on a seven point scale. The self-perception questionnaire was tested and modified during the previous year.

(c) Self-Confrontation Questionnaire. In addition to the self-perception questionnaire, a questionnaire was developed which measured how each experimental subject reacted to his self-confrontation experience. Particular emphasis was given to having the subject make a judgment relative to his clinical effectiveness with his client. The self-confrontation questionnaire was administered immediately after a single confrontation experience. The questionnaire items were taken from the instrument used in the 1968-1969 project.

(d) Self-Evaluation of Clinical Competence Rating Scale. Each subject after viewing himself was asked to complete a six item questionnaire evaluating his own clinical session. A nine point rating scale was used for this self-scoring of one's own therapy.

(e) Speech Category System. To help the subjects develop an awareness of what went on in their therapy sessions the investigators constructed a Therapy Category System which included ten observable categories of things that "could go on in therapy". Whatever happened in a therapy session could be classified under one of the ten categories. The category system permitted the clinician to score his own videotaped therapy enabling him to see how a client responded to his directions, suggestions, rewards, and punishments.

(f) Subject Data. Besides the dependent measures that were developed further information was obtained on each subject. For example, senior faculty members were asked to rate each subject relative to his academic, experimental, and clinical competency. Each subject's Minnesota Multiphasic Personality Inventory (MMPI) scores were available as well as his Verbal-Quantitative scores on the Graduate Record Examination. These data were used to compare a subject's personal characteristics with his performances on various dependent measures.

(g) Speech Therapy Concept Semantic Differential. A semantic differential instrument employing three evaluation, three potency, and three activity scales, was constructed. (See Appendix C) The following concepts were included: positive, negative, immediate, and partial reinforcement; psychoanalytic, operant, and non-directive therapy; client-clinician rapport; and client feelings. Each subject completed this questionnaire before and after the confrontation training.

(h) Knowledge of Learning Theory Test. This test consisted of ten terms to be defined by the clinician. Also ten reinforcers which had to be classified as primary or secondary and verbal or nonverbal were included. (This test is included in Appendix D.)

<u>The Pilot Study with Two Trainees on Audiotape Procedures</u>.

The project staff had developed competency using the videotape equipment

for single and double confrontation experiences in the 1968-69 project. The major need was to develop audiotape self-confrontation procedures using the same methods as in videotape confrontation. Each subject was recorded during one therapy session. The audiotape was scored using the same category system developed for VTR confrontation. No problems were experienced.

Phase II

The experimental phase of the project, Phase II, began in September, 1969, and ran through March 15, 1970. The test procedures developed earlier were utilized in Phase II. As the Fall Quarter began at the University of Denver in late September, 1968, some 40 student clinicians began their clinical practicum experience in the Speech and Hearing Center. By a process of random selection 20 student trainees were assigned to the project by the clinical director. It had been hoped that 30 subjects would be available, but a number of clinicians had been subjects in the prior study and could not be re-used. Each subject was assigned the normal caseload of clients with a supervisor for each clinician. Every subject was then randomly assigned to one of two conditions. Ten subjects were assigned to the audiotape confrontation experimental group; and ten were selected to participate in the videotape experimental group. Each subject served as his own control by means of an initial base rate count and a follow-up base rate check.

At the beginning of Phase II all subjects were assembled by the project investigators and given their group assignments. Each subject was given a series of tests: the Denver Q-Sort, the Self-Perception Questionnaire, the Speech Therapy Concept Semantic Differential, and a Knowledge of Learning Theory Test. A taping was made of each subject's initial therapy session for baseline measurements.

Half of the experimental subjects, both those in the audio and video confrontation condition, were videotaped twice a week throughout the Fall Quarter, 1969. The other half were taped twice a week during the Winter Quarter, 1970. Videotape subjects viewed their therapy sessions immediately after the session or as soon thereafter as possible. Audio-only subjects' videotapes were played back with the TV monitor turned off so that only the audio portions of the tapes could be heard. This insured that both groups received approximately equivalent audio information. A project trainer was always with a subject when he viewed himself. It was often necessary for the project office to devote as much as nine hours a day to taping and playback. Because of the equipment requirements for twice-a-week confrontation schedules, two videotape recorders had to be kept in good working condition at all times. Equipment problems were constant, requiring much scheduling and re-scheduling. By using loaner equipment, all subjects were able to maintain their taping and confrontation schedules.

The Videotaping Procedures.

Each experimental subject was videotaped eight times in one quarter while engaged in therapy sessions. Taping was accomplished through a wall port in the therapy room. A one-way mirror could be placed over the port if the clinician wished to minimize distraction to the client or if it was felt the camera would arouse excessive anxiety in the client. Otherwise, the session was taped without the mirror.

The usual procedure in taping was to get as much of a close-up as possible of the therapist and client. With some clients, particularly children, this proved difficult at times, because of the amount of postural shifting or moving around the room. Adult clients usually could be taped close-up more easily. Every effort was made to keep both client and clinician in view, but if a choice had to be made, the clinician was chosen. The training experience was oriented toward changing therapist behavior, not client behavior, and it was felt important to record the clinician's facial and gestural cues as well as the verbal interaction.

Audio was picked up by a microphone suspended six feet above the floor and right over the therapy room table. Recording level, on the Ampex recorders, was always at the maximum setting.

The Self-Confrontation Sessions.

Each experimental subject was exposed to eight self-confrontation sessions over a period of one academic quarter at the University of Denver. Half the subjects were given audio self-confrontation a total of eight times. The other half experienced eight VTR self-confrontations.

The self-confrontation sessions consisted of three distinct segments. First, the subject viewed or listened to approximately five minutes of his own therapy session on TV playback. As pointed out, the subject himself selected the segment that he wanted to observe. The subject scored the replay, using the Speech Therapy Category System discussed earlier. The tape was then rewound, then that subject viewed or listened to the same segment again, but without scoring it. Finally, the subject filled out a series of forms consisting of the Self-Perception Questionnaire, the Self-Confrontation Questionnaire, and the Self-Evaluation of Clinical Competence Questionnaire.

During the first five-minute viewing sequence, a trainer scored the tape along with the subject. The trainer consisted of the project's research assistant, Mr. Thomas Prescott; the project technician, Miss Florence Berman; or the project coordinator, Dr. Stech. Either the subject or the trainer could stop the playback at any time with a

remote switch located within easy reach where the scoring was being performed. The therapist was instructed to stop the tape any time he got behind in the scoring or had a question about the categorizing procedure. The trainer stopped the tape whenever he felt he was getting behind in the scoring or felt that the therapist was behind or scoring incorrectly. During the first two or three sessions the trainer and therapist added up the total number of acts to get a quick, rough reliability check. In addition, any noteworthy facets of the therapy segment were discussed, particularly unusual patterns of reinforcement or problems related to the control of client responses.

The second five-minute viewing was done without scoring. The therapist was instructed to stop the tape any time he felt a desire to discuss some aspect of the therapy session. Usually, discussion or comment centered around an interesting aspect of the therapy session or a problem which had become obvious through scoring or which was blatant or obvious without scoring. Some therapists did not stop the tape at all during the second viewing, and a few did not even comment after the second viewing.

At the close of the six month training period all subjects were retested using the previously described dependent measures. In addition, a final base-rate tape was obtained at least two months, but no more than three months, after the final confront session. A specific data protocol was developed for each experimental subject describing his overall characteristics as measured by various data, a description of his overall therapy as described by his cumulative therapy matrices, and his skill in the use of behavioral principles in therapy.

FINDINGS AND ANALYSIS

Report of the Denver Q-Sort.

The Denver Q-Sort was administered to the audio- and video-confrontation subjects at the beginning and at the end of the experiment. Every subject was asked to sort the instrument twice during each administration. Once to indicate how he actually perceived himself as a clinician (actual), and once to describe the characteristics of what he considered to be an ideal clinician (ideal). A copy of the Q-Sort items can be found in Appendix B.

The Denver Q-Sort provided a measure of each subject's actual and ideal clinician perceptions at the beginning and at the end of the study. The correlation, Pearson r, between the actual and ideal sorts was computed for each subject. The shift in correlation values from the pre- to the post-Q-Sort administration was examined individually for the audio-confrontation subjects and the video confrontation subjects. These results indicated a significant (sign test, $p < .01$) convergence between the actual and ideal sorts as a result of the confrontation experience for the video-confrontation group. This convergence was not significant for the audio-confrontation group.

The above findings differ from the findings of the previous year. Several factors may have contributed to this change. First, the instrument was modified by eliminating 20 low discrimination items. Second, the current project was designed to provide a more intense confrontation exposure. Third, the subject population was considerably different relative to clinical background and experience than the subject population of a year ago. These factors may be interpreted to indicate that the current Q-Sort will reflect changes in a subject's concept of actual and ideal clinician behaviors. The convergence of actual and ideal correlations by the video-confrontation group suggests that intense video confrontation exposure will result in a clinician modifying his actual clinical concept to more closely conform with his ideal clinical concept.

Report of the Self-Perception Questionnaire Results.

The semantic differential questionnaire completed at the end of each self-confrontation session provided an opportunity for each subject to evaluate himself on an evaluation type scale. The average self-perception scores for sessions one through eight were analyzed utilizing an analysis of variance technique. These results did not indicate any significant differences over time for either the audio- or the video-confrontation groups. When

the scores obtained for the audio-confrontation group were compared to the scores obtained for the video-confrontation group, no differences were observed.

These results indicated that the confrontation experience did not affect the self-perception of the subjects. The two groups were similar relative to self-perception.

Report of the Self-Confrontation Questionnaire Results.

Four self-confrontation questionnaire items were analyzed to determine the presence or absence of differences within and between the experimental groups. Each nine point scalar item was analyzed individually.

The first question was, "How do you feel about this experience? How valuable was this experience as an aid in learning the practical aspects of therapy?" The second question was, "To what extent did you look and/or sound like yourself on videotape or audiotape?" The above questions were followed by the questions, "How effective were you in rewarding the client for proper behavior?" and, "How effective were you in negatively reinforcing the incorrect client behavior?" Analyses of variance measures were conducted individually for each of the above questions to determine the presence or absence of differences over time for the eight sessions. Significant differences were found for the audio-confrontation group for question number one ($p < .05$), question number two ($p < .01$), and the final question ($p < .01$). Trend analyses were computed to see if the above differences demonstrated any order over time. None of the questions listed above revealed significant trends. No differences were found for the video-confrontation group.

Finally, the audio-confrontation group was compared to the video-confrontation group for each of the self-confrontation questions. No differences were observed.

Report of Session-by-Session Shifts in Reinforcer Ratios, 1968-69 Study.

The positive reinforcer ratio (PRR) and negative reinforcer ratio (NRR) for each clinician was calculated for each session recorded in the 1968-69 research project. The results are shown in Figures 1 and 2. Generally, the PRR begins at a fairly high level in the first session recorded during the Fall Quarter, drops to a lower level in the second recorded session, and then increases slightly in the third session. Between the Fall and Winter Quarters, there is an extinction effect as shown by the increase of the PRR to a level equal to that at the beginning of

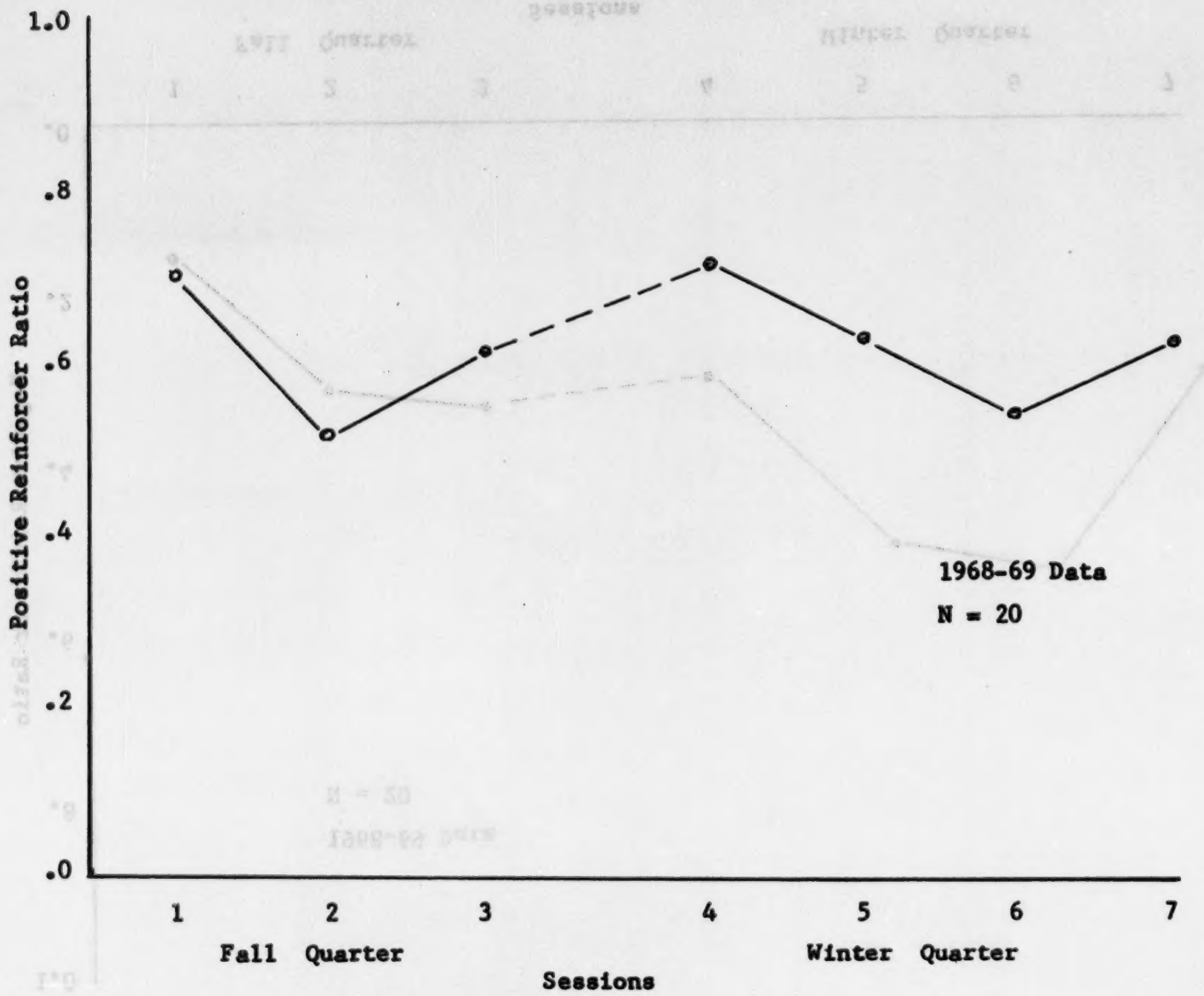


Figure 1

Changes in Positive Reinforcer Ratio over Seven Therapy Sessions, 1968-69.

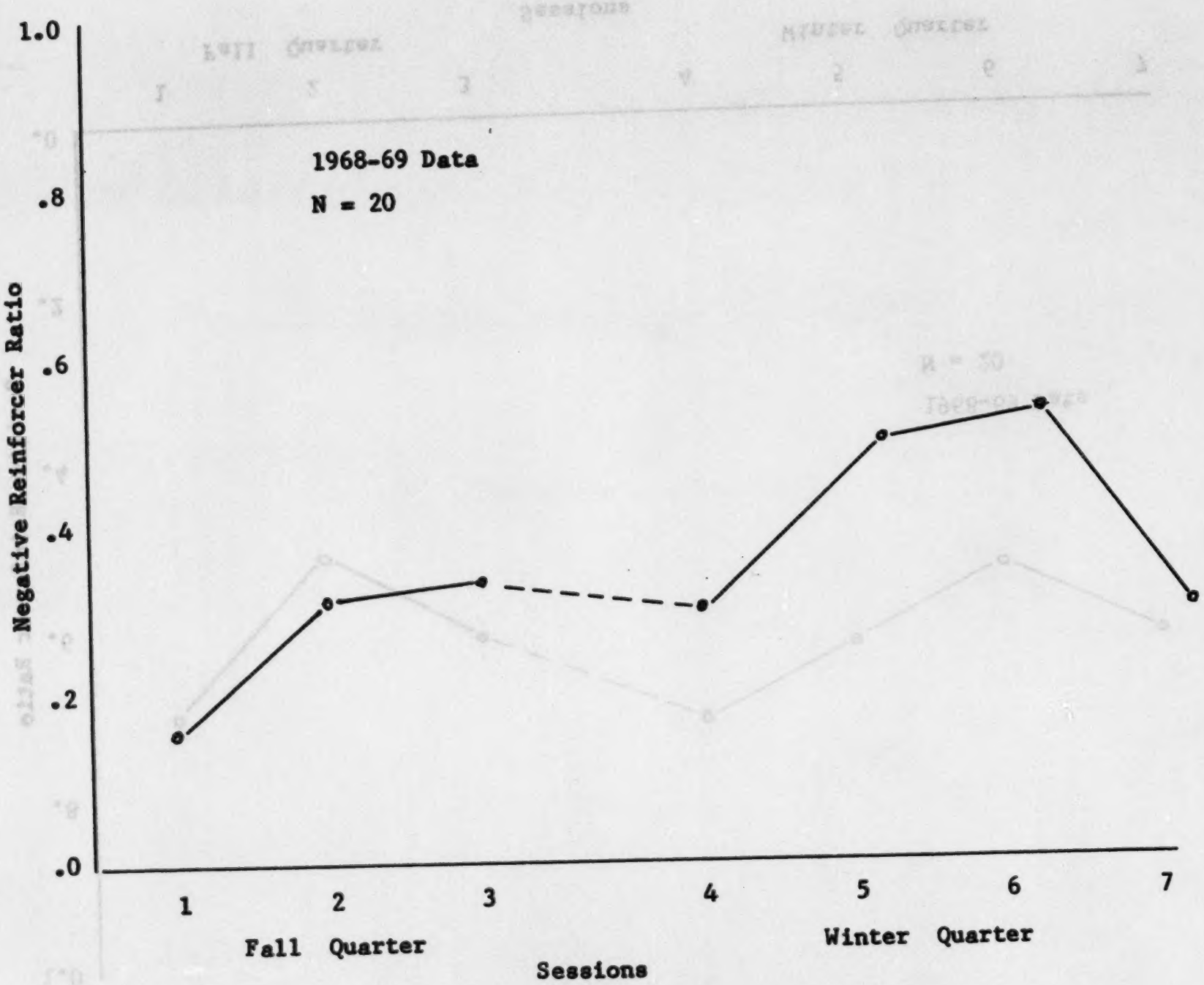


Figure 2

Changes in Negative Reinforcer Ratio over Seven Therapy Sessions, 1968-69.

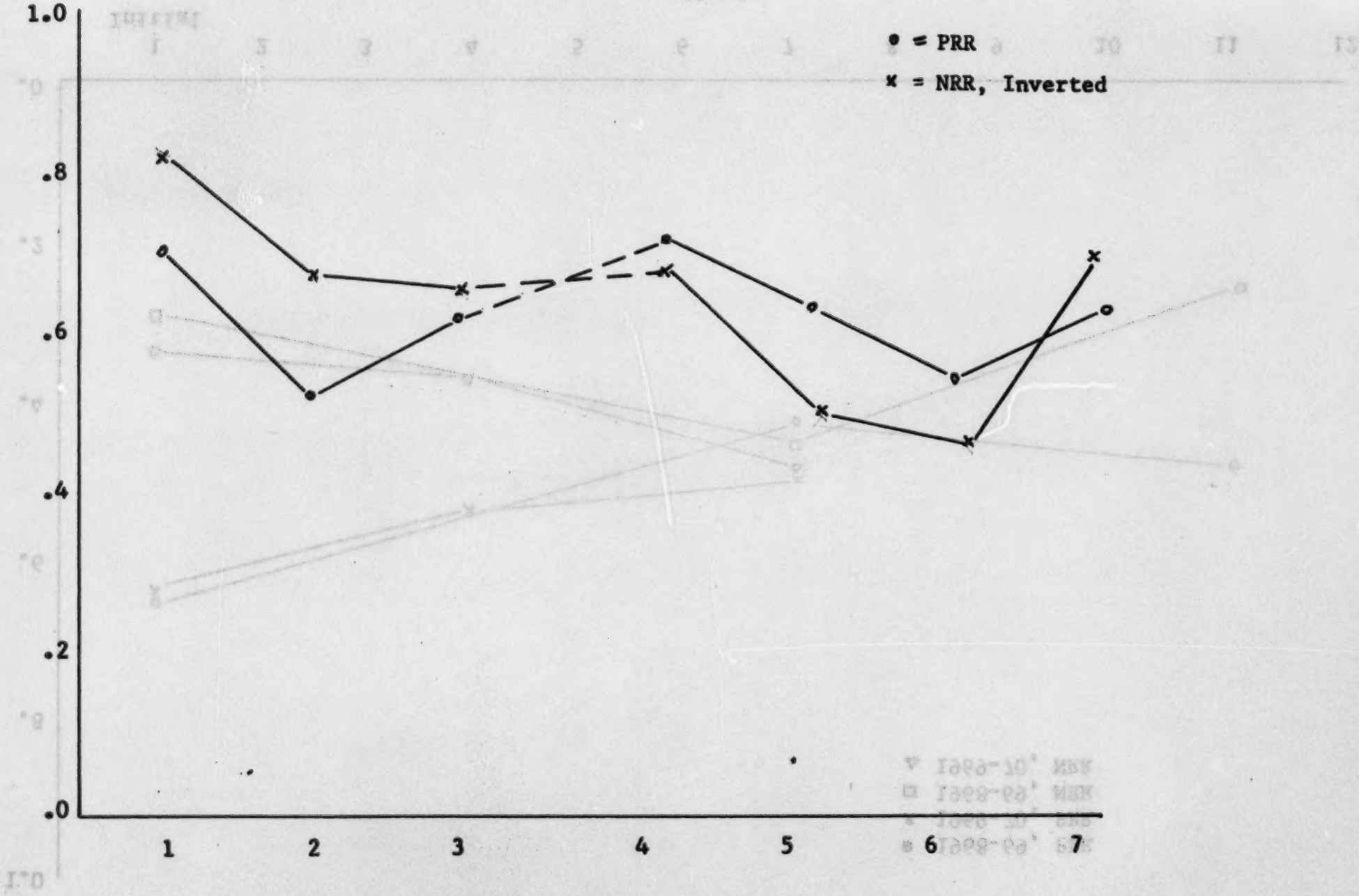


Figure 3

Comparison of the Inverted Negative Reinforcer Ratio Curve to the Positive Reinforcer Ratio Curve.

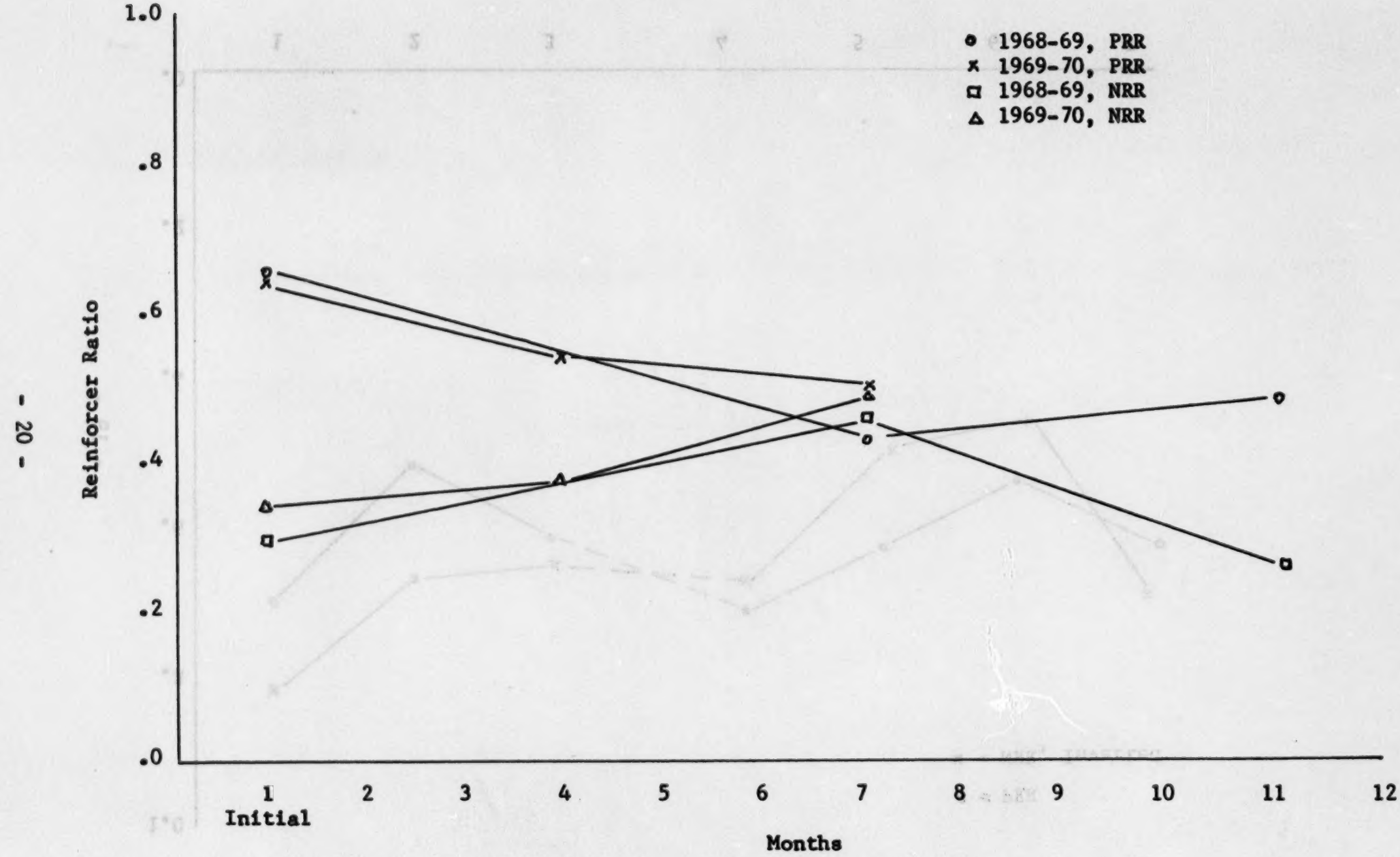


Figure 4

Comparison of PRR and NRR Curves (Initial, Final, and Post Sessions) for the 1968-69 and 1969-70 Studies.

the Fall Quarter. The trend is then downward for two sessions with a slight upward movement in the seventh and final session.

The shifts in NRR are roughly equivalent except that the ratio begins at a very low level and increases steadily. There is less apparent, extinction between quarters. The level builds through the next two sessions in the second quarter and then drops in the final session. Actually, the NRR curve is roughly the mirror image of the PRR curve. Figure 3 shows the two curves together with the NRR curve inverted. The similarity in the trends is more apparent in this presentation of the data.

As part of a dissertation study (Prescott, 1969), reinforcer ratio data were available on a portion of the clinician population used in the 1968-69 study. Figure 4 shows the initial reinforcer ratios in the first quarter, the final reinforcer ratios in the Winter Quarter, and the ratios for the Summer quarter obtained by Prescott. These data show in part the extinction effect after the videotape training project was completed.

Report of Session-by-Session Shifts in Reinforcer Ratios, 1969-70 Study.

The reinforcer ratios were calculated for each clinician in each session in the 1969-70 study. As noted previously, this project differed from the earlier one in that each clinician was given eight self-confrontation sessions in one quarter. Half of the videotape group and half of the audiotape group received confrontation in the Fall Quarter, and the other half of each group received confrontation in the Winter Quarter. Figures 5 and 6 show the results for the two groups in terms of PRR and NRR respectively. There is no apparent difference between the two groups in the change in reinforcer ratio.

The course of changes in the two ratios is quite similar for the two kinds of confrontation. The PRR starts out at around 55-60% and then rises to a higher level in the second and third sessions. The ratio drops to a fairly consistent level around 60-65% over the last five sessions. The NRR begins at a very low level and moves steadily upward to a consistent level around 45%.

Changes in the total use of reinforcers is instructive, as shown in Figure 1. The initial sessions show a low rate of reinforcement compared to subsequent sessions. The overall reinforcement rate then increases for two sessions and decreases to a fairly consistent value around 55% for the last four sessions.

These data are somewhat different from those collected in the preceding year. In the 1968-69 data, the PRR starts out high and comes down whereas in the 1969-70 study, the PRR starts low, goes up, and then comes back down. The NRR in both studies starts low and climbs

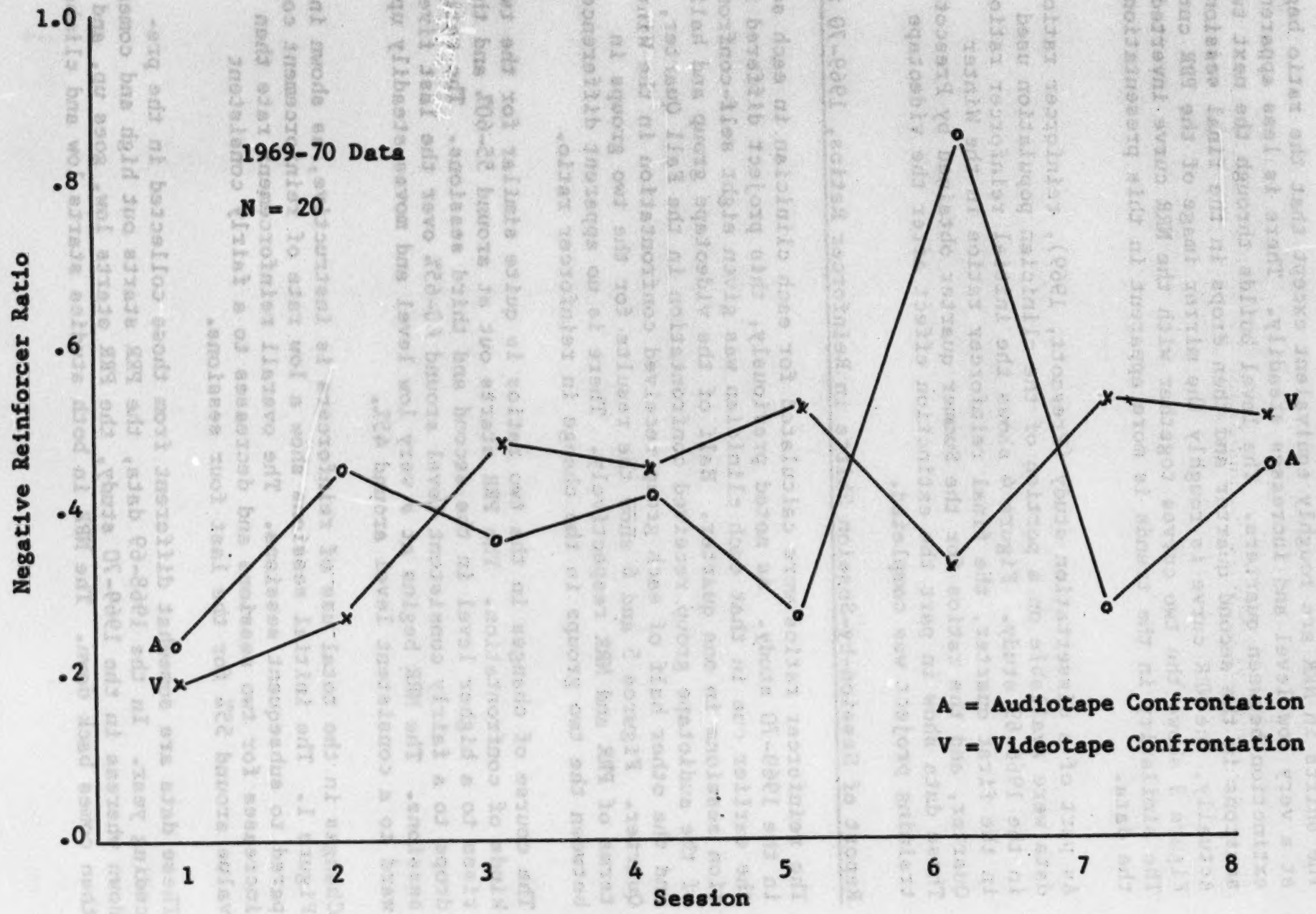


Figure 5

Comparison of Audiotape and Videotape Confrontation Groups on Negative Reinforcer Ratio for Eight Sessions, 1969-70.

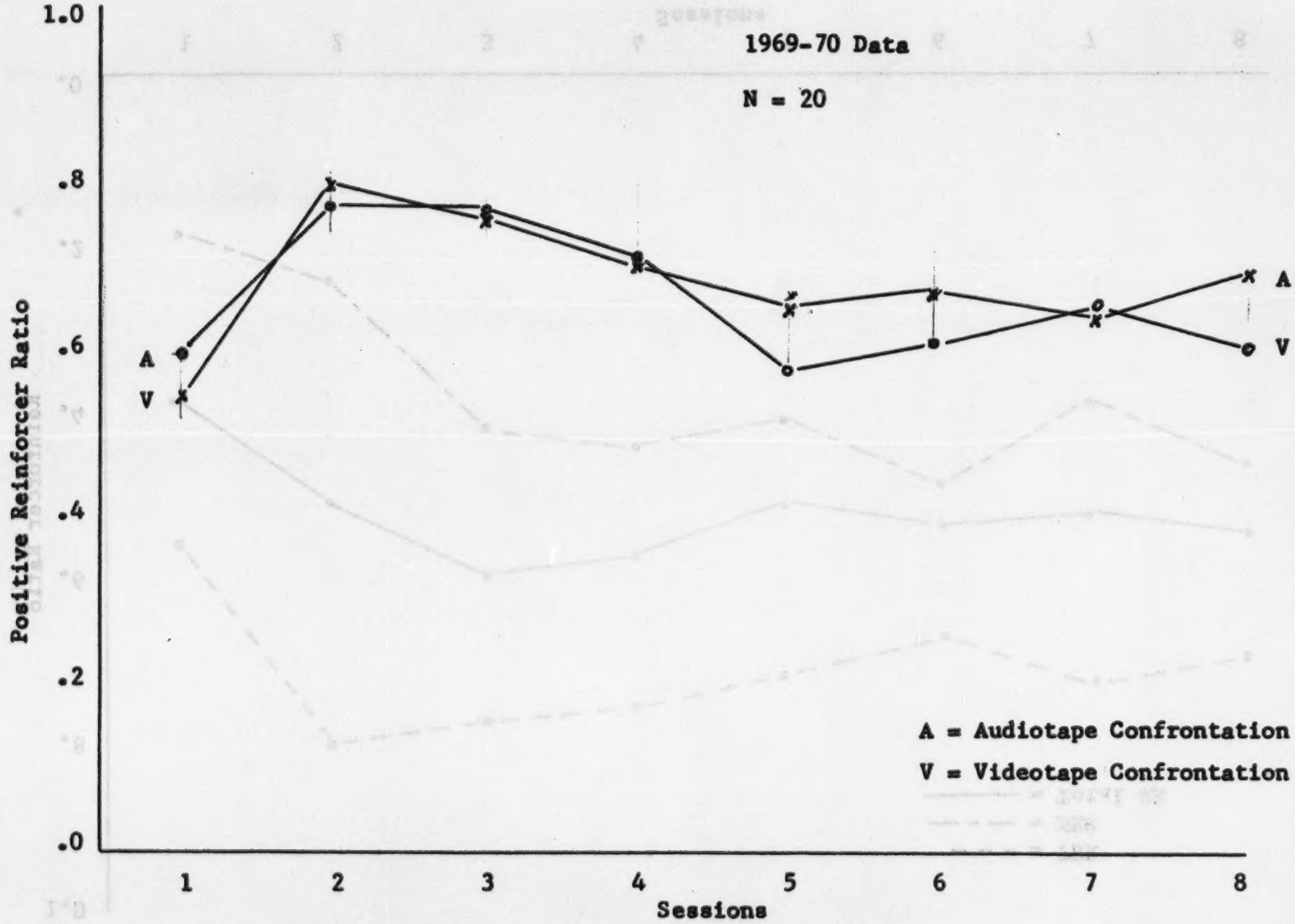


Figure 6

Comparison of Audiotape and Videotape Confrontation Groups on Positive Reinforcer Ratio for Eight Sessions, 1969-70.

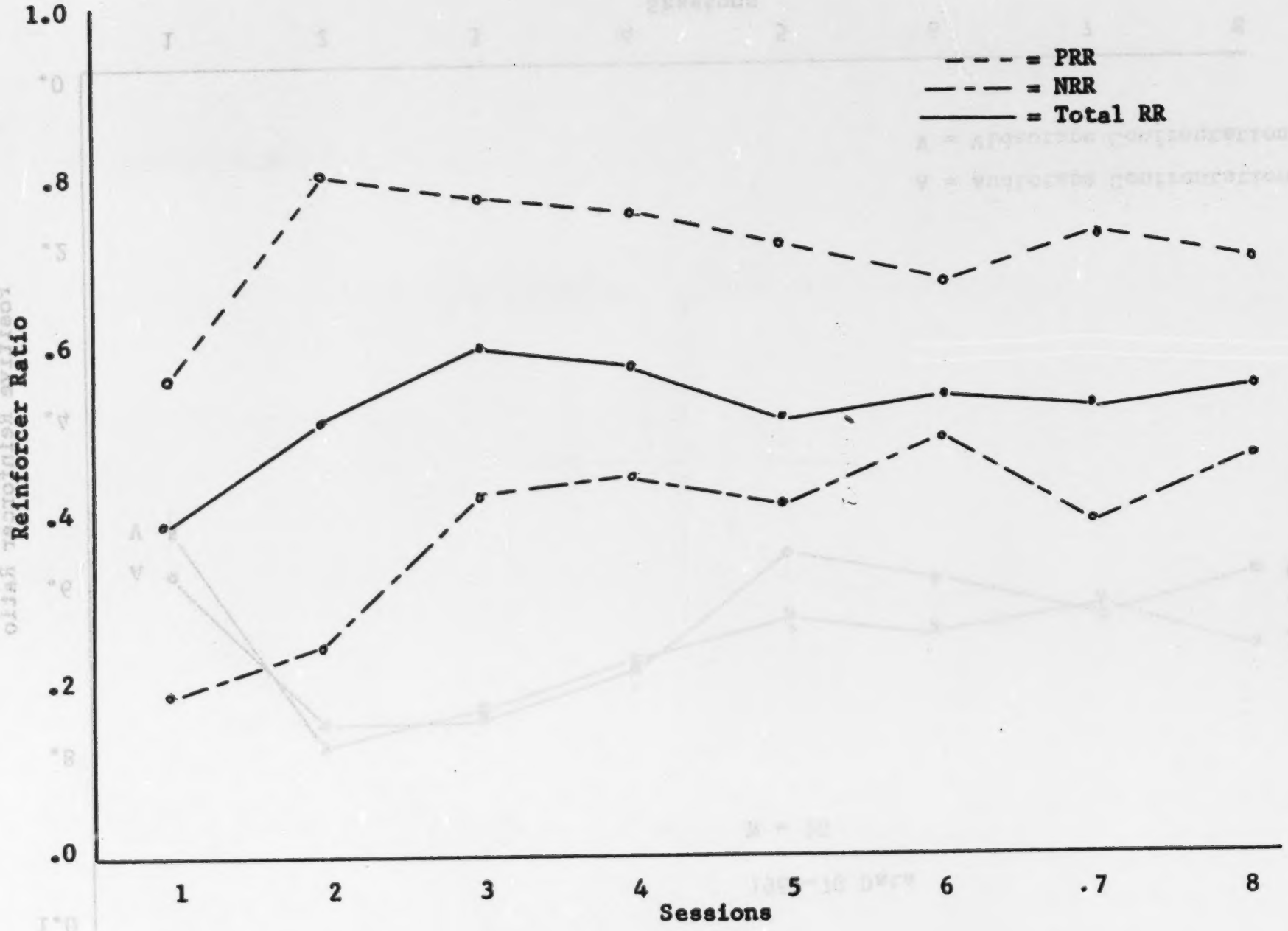


Figure 7

PRR, NRR, and the Total Reinforcer Ratios, Audiotape and Videotape Data Combined, for Eight Sessions, 1969-70.

to a value around 50%. A probable reason for the differences in the PRR shifts is that the 1969-70 data actually represents initial sessions which occurred earlier in the academic quarter than the 1968-69 data. The initial sessions for the present study were taped, for the most part, in the first and second week of therapy in the Fall Quarter. The initial sessions for the earlier research were taped in the second, third, and fourth weeks of therapy since each clinician was to be taped only three times in that quarter.

Report of Comparisons of Shift in Reinforcer Ratios and Self-Evaluation of Reinforcement Effectiveness.

An interesting comparison can be made between the ratings clinicians gave themselves on the use of reinforcers and the actual reinforcer ratios that were being employed. The results are shown graphically in Figures 8 and 9. Generally, the self-ratings are quite congruent with the shifts in reinforcer ratios with the exception of the first session. In terms of PRR, the clinicians rated themselves as more effective when this ratio decreased. The opposite occurred with NRR, with the exception of session 6. In this session, the use of negative reinforcers increased dramatically for some unknown reasons, and the clinicians rated their own performance as less effective in that session. Inspection of the raw data showed that the increase in use of negative reinforcers and the lower effectiveness ratings were fairly general and not due to one, two, or three clinicians.

These findings tend to indicate that the clinicians used in this study were rating their own use of reinforcers quite accurately. Although further confirmation of this kind of result is needed before sweeping generalizations can be made, the data do indicate awareness on the part of clinicians of their effectiveness when given audiotape or videotape confrontation and when provided with behavioral feedback.

Report of Initial and Final Reinforcer Ratio Changes.

The positive reinforcer ratio (PRR) and negative reinforcer ratio (NRR) were calculated from the five-minute segments of the first and eighth sessions which were scored as part of the self-confrontation procedure. The data for the audio and video groups combined are shown in Tables 1 and 2. The PRR showed a nonsignificant trend toward more use of positive reinforcers. The increase in NRR was significant at the .001 level.

Table 1

Change in Positive Reinforcer Ratio Based on Five-Minute Segments of the First and Eighth Sessions. Audio and Video Groups Combined

	First Session	Eighth Session
PRR Above 50%	13	16
PRR Below 50%	7	4

($\chi^2 = 3.81$, $p < .10$, $> .05$)

Table 2

Change in Negative Reinforcer Ratio Based on Five-Minute Segments of the First and Eighth Sessions. Audio and Video Groups Combined

	First Session	Eighth Session
NRR Above 50%	3	10
NRR Below 50%	13	6

($\chi^2 = 13.06$, $p < .001$)

An increase in PRR ($p < .10$) was obtained, which is opposite to the trend obtained in the 1968-69 project. However, the present data represent a PRR and NRR obtained earlier in therapy when, according to the session-by-session data, both ratios are quite low. The 1968-69 data represent a PRR obtained later in the academic quarter, probably when the PRR was at its peak. These differences point up the importance of knowing the entire course of PRR and NRR changes over a time period such as the academic quarter.

The increase in NRR is consistent with the 1968-69 findings. When given behavioral feedback via VTR self-confrontation and behavior scoring, clinicians tend to use more negative reinforcers ($p < .001$).

Due to the small N in this study, there is no valid way to compare the video and audio treatment groups on positive-negative reinforcer ratios. A Chi-Square analysis was performed, even though some of the values in the "Expected" column were smaller than 5, which

violates a rule for the use of Chi-Square. The result was a non-significant difference between the groups for both PRR and NRR (χ^2 = 1.09, 2.32; df = 3; p < .50). Table 3 summarizes the reinforcer ratio values for easy comparison, and the similarity of the video and audio groups is evident.

Table 3
Distribution of Reinforcer Ratios for the Audio and Video Groups

			Initial Session	Final Session
Negative Reinforcer Ratio	Audio	> .50	1	4
		< .50	6	3
	Video	> .50	2	5
		< .50	7	4
Positive Reinforcer Ratio	Audio	> .50	6	7
		< .50	4	3
	Video	> .50	7	9
		< .50	3	1

Note: The NRR could not be calculated for three Audio Subjects and one Video Subject because no negative reinforcers occurred in the five-minute time sample.

Report of Statistical Regression Effects in Reinforcer Ratio Changes, 1968-69 and 1969-70 Studies.

Both the the 1968-69 and 1969-70 reinforcer ratio showed tendencies toward a decrease in use of positive reinforcers and an increase in use of negative reinforcers. One possible explanation for these findings is that there is a general regression toward a median value. PRR starts high, typically in the 60%-70% range. NRR, on the average, begins at 0% -20%. Thus, the high rate reinforcer becomes less frequent and the low rate reinforcer occurs more often.

The regression hypothesis can be tested by finding the correlation between change in reinforcer ratio and the initial ratio level. Calculation showed that change in PRR was rank order correlated with initial level ($\rho = .68$, $p < .01$). NRR changes was correlated with initial level also ($\rho = .61$, $p < .01$). These findings support the hypothesis that observed changes are related to initial reinforcer ratio level. The higher the initial level, the more likely the changes will be to a lower level. The lower the initial level, the more likely the changes will be upward.

The 1968-69 data were re-analyzed to check the regression hypothesis. The PRR correlation with PRR change was .62 ($p < .01$). The NRR correlation with NRR change was .58 ($p < .05$). These findings, once again, confirm the regression hypothesis. The relationships, for the 1968-69 and the 1969-70 data combined, are presented graphically in Figures 10 and 11. Figure 12 shows all the reinforcer changes, positive and negative, plotted against initial level for the 1968-69 and 1969-70 data combined.

Audio and video self-confrontation group correlations were calculated separately for the 1969-70 study, and no significant difference between the groups was found. Both conditions resulted in a regression effect on reinforcer ratio.

Report of Prediction of Behavior Change Data.

Previous research (Stech, 1969) had shown a relationship between various predictor measures and change in reinforcer ratio. High levels of clinical experience, high academic schievement, and emotional stability were correlated significantly with change in NRR. High levels of experience, lower academic achievement, and less emotional stability were correlated significantly with change in PRR.

During the 1969-70 research, an attempt was made to replicate the predictor findings. the MMPI was given to each clinician, and the clinician's undergraduate GPA was calculated. GRE scores were obtained for the graduate students. Finally, each clinician filled out a form describing the amount of his clinical and/or teaching experience.

None of the findings of the earlier research were reproduced at a significant level. All correlations were below .35, although they tended to be of the same sign as in the previous study. The most probable cause for lack of replication can be found in the composition of the subject pool. The 1969-70 study involved nine undergraduates, nine M. A. candidates, and two Ph. D. candidates. The 1968-69 subjects consisted of three undergraduates, 13 M. A. candidates, and four Ph. D. candidates. Furthermore, the 1968-69 predictor measures

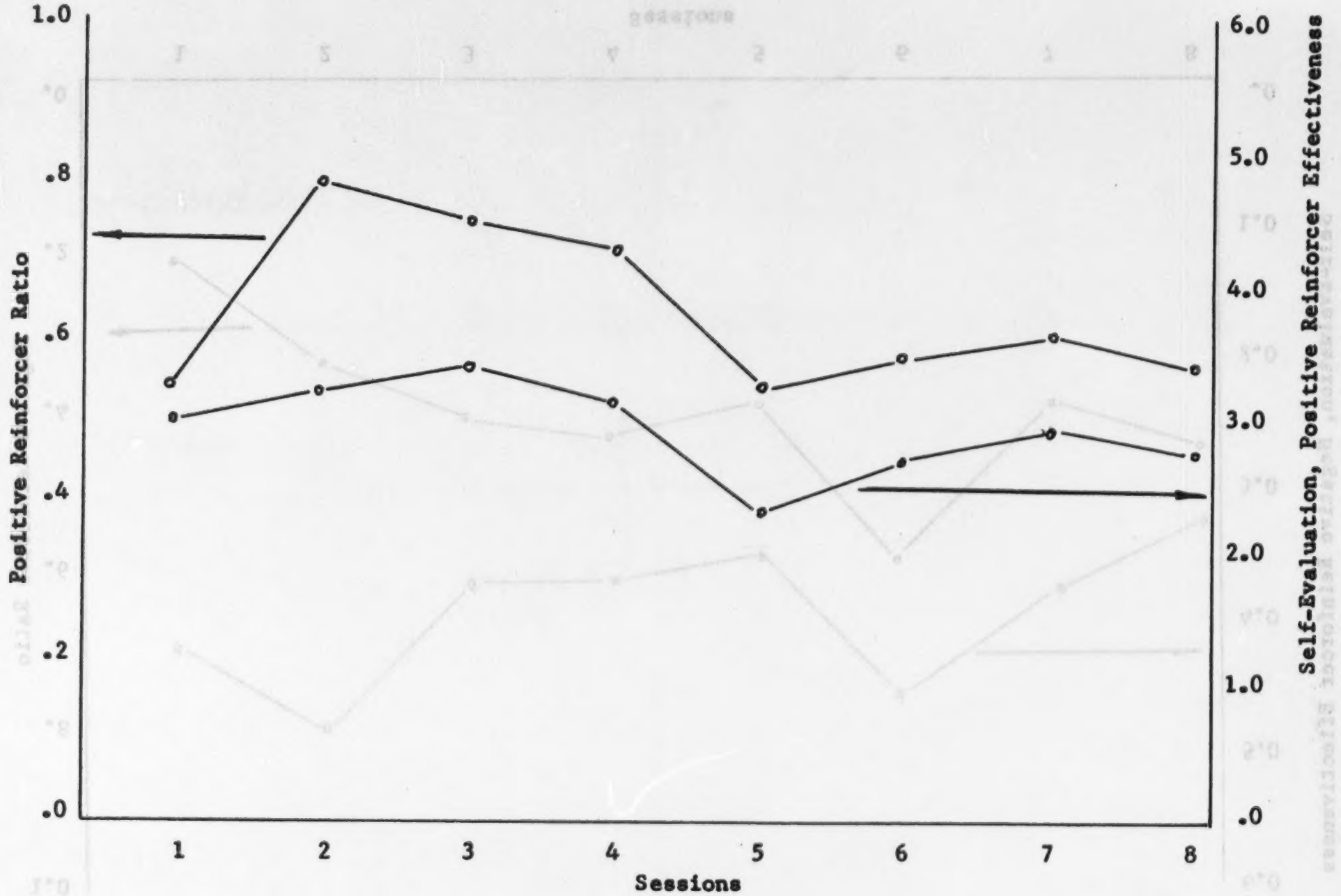


Figure 8

Comparison of PRR and Self-Evaluation of Positive Reinforcer Effectiveness for Eight Sessions, 1969-70.

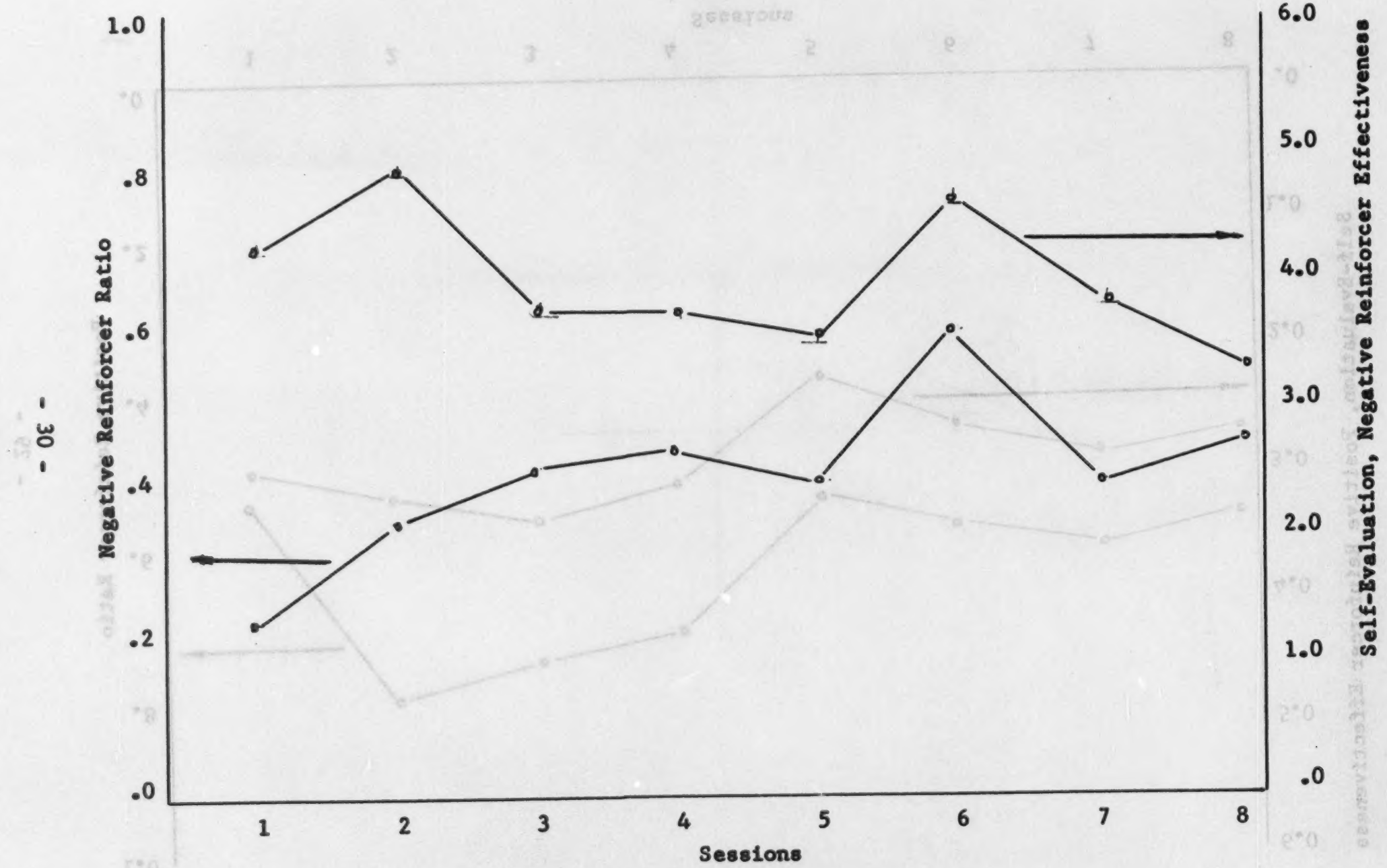


Figure 9

Comparison of NRR and Self-Evaluation of Negative Reinforcer Effectiveness for Eight Sessions, 1969-70.

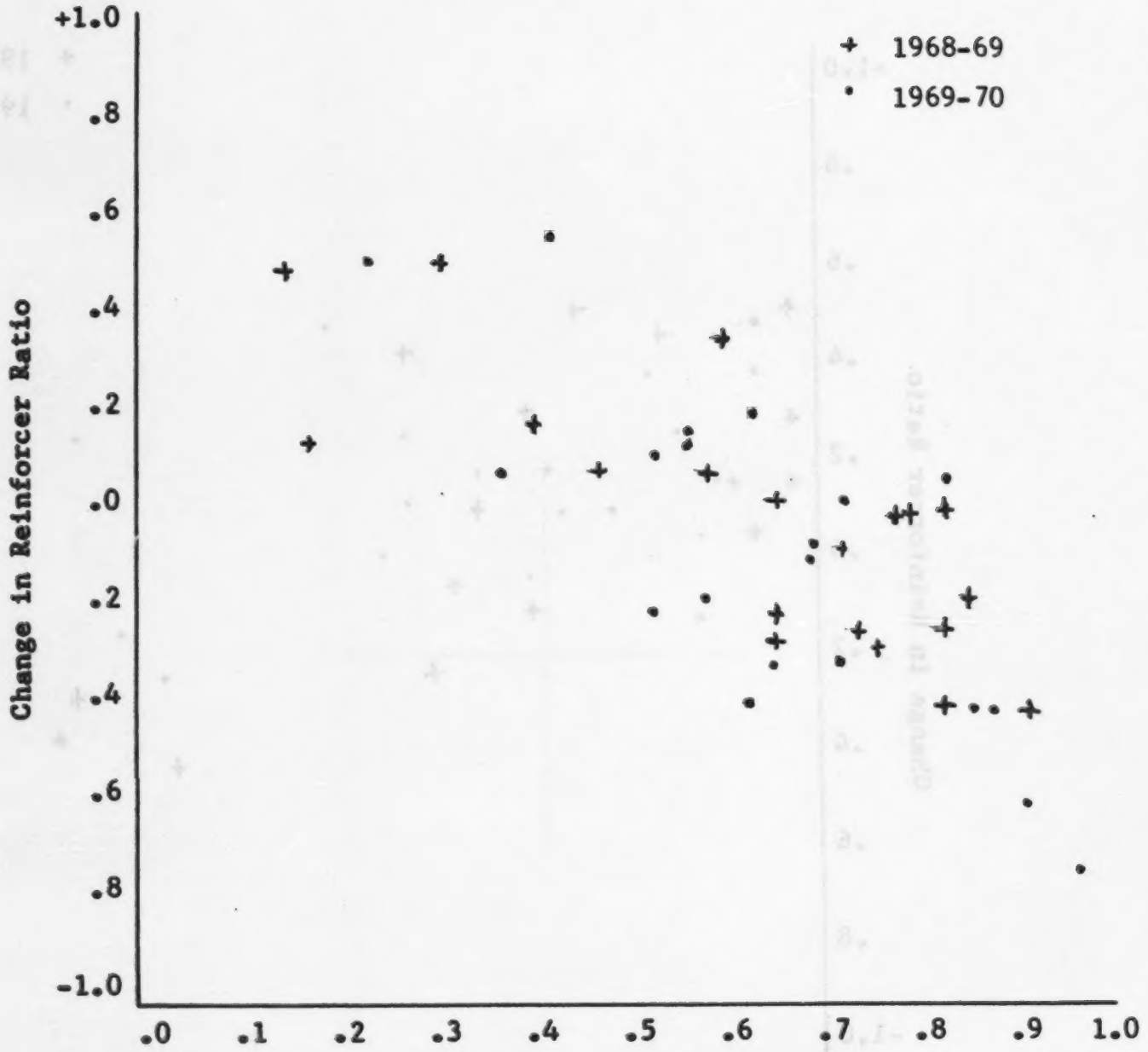


Figure 10

Scattergram of the Initial PRR and the Change in PRR to Final Session, 1968-69 and 1969-70 Data.

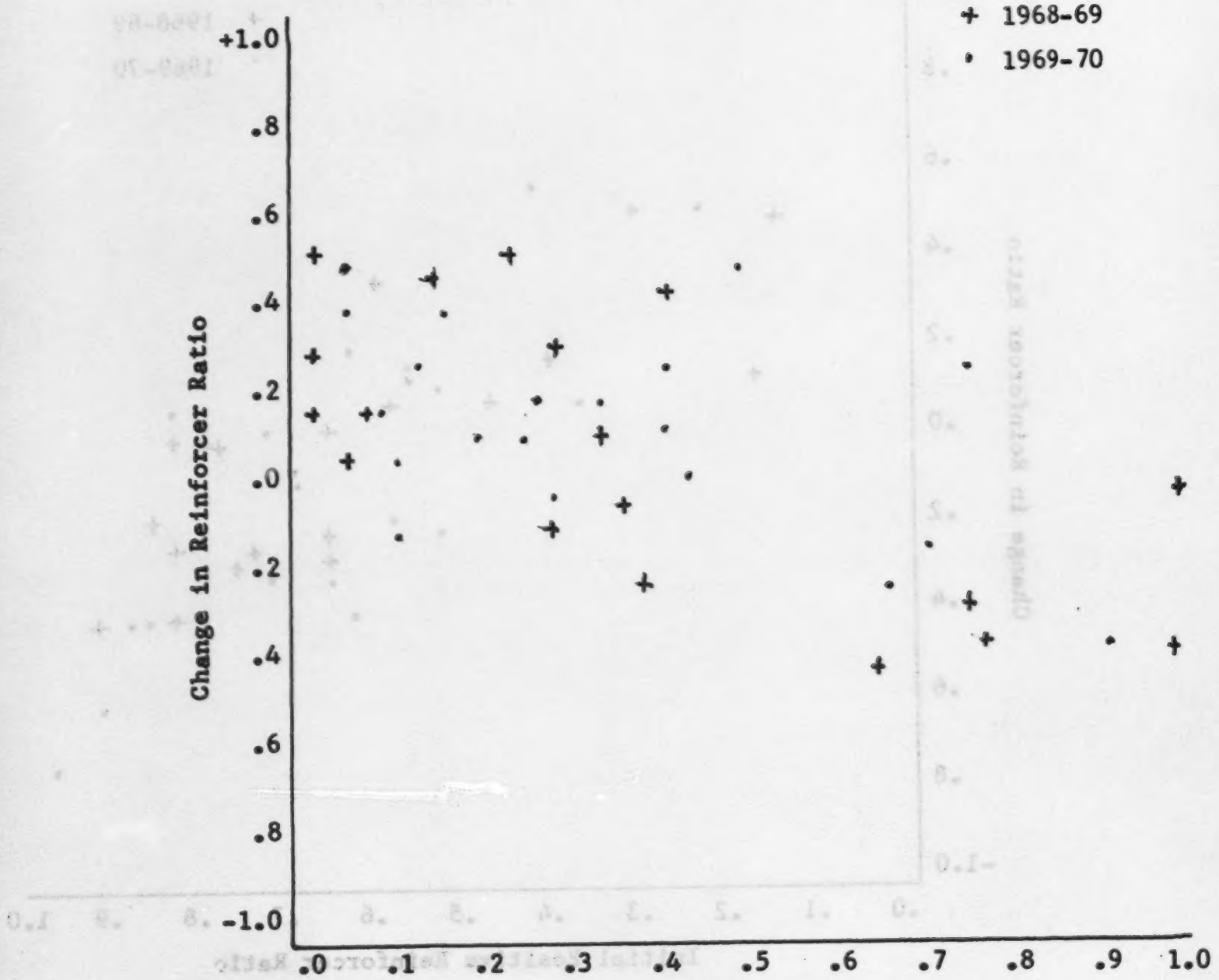


Figure 11

Scattergram of the Initial NRR and the Change in NRR to Final Session, 1968-69 and 1969-70 Data.

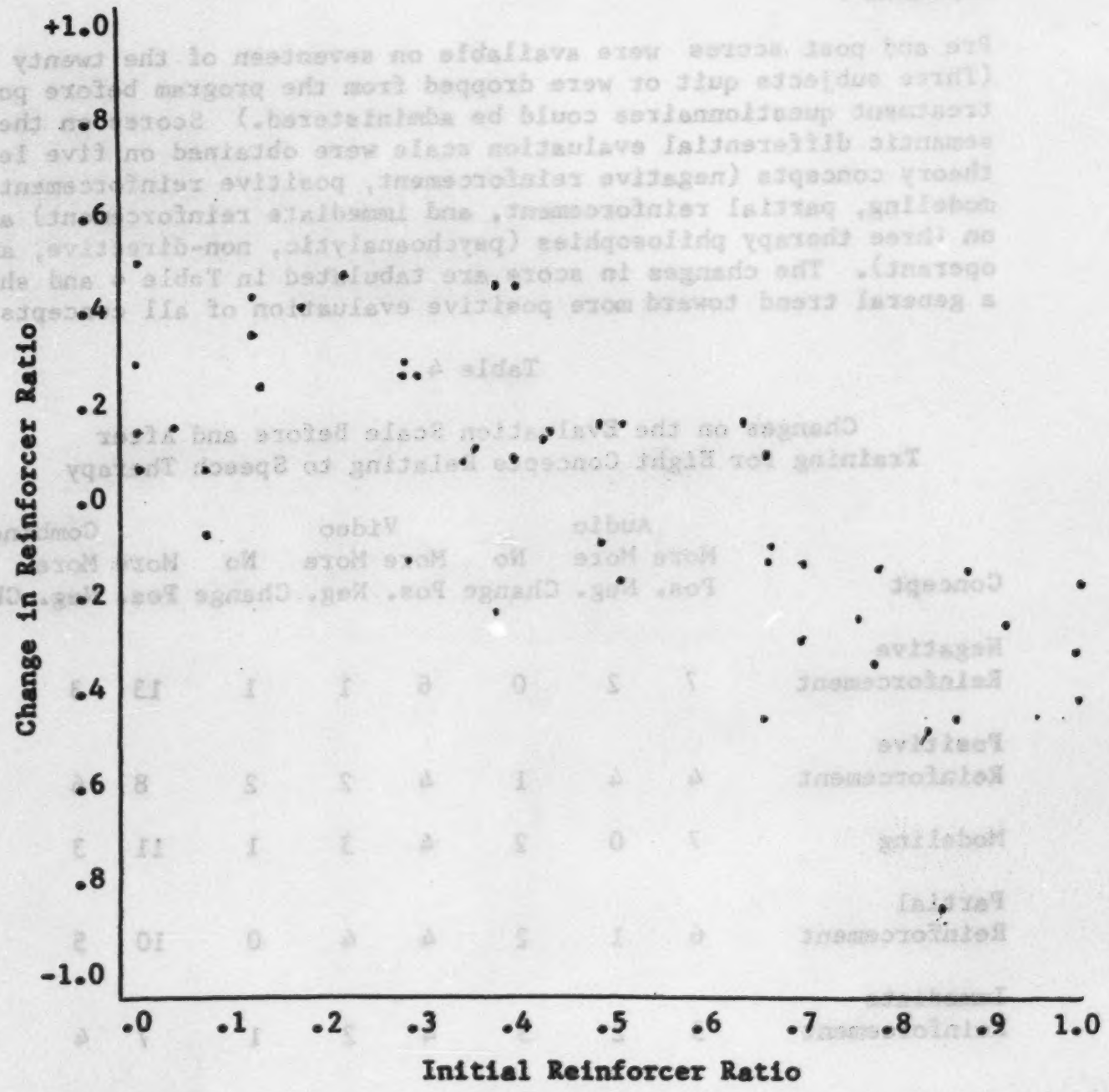


Figure 12

Scattergram of Initial PRR and NRR and the Change in PRR and NRR, 1969-70 Data Only.

seemed to work most effectively in predicting M. A. candidate changes. It seems probable that the large number of undergraduates was one cause of the lack of replication.

Report of Changes in Semantic Differential Ratings of Speech Therapy Concepts.

Pre and post scores were available on seventeen of the twenty subjects. (Three subjects quit or were dropped from the program before post-treatment questionnaires could be administered.) Scores on the semantic differential evaluation scale were obtained on five learning theory concepts (negative reinforcement, positive reinforcement, modeling, partial reinforcement, and immediate reinforcement) and on three therapy philosophies (psychoanalytic, non-directive, and operant). The changes in score are tabulated in Table 4 and show a general trend toward more positive evaluation of all concepts.

Table 4

Changes on the Evaluation Scale Before and After Training for Eight Concepts Relating to Speech Therapy

	Audio			Video			Combined		
Concept	More Pos.	More Neg.	No Change	More Pos.	More Neg.	No Change	More Pos.	More Neg.	No Change
Negative Reinforcement	7	2	0	6	1	1	13	3	1
Positive Reinforcement	4	4	1	4	2	2	8	6	3
Modeling	7	0	2	4	3	1	11	3	3
Partial Reinforcement	6	1	2	4	4	0	10	5	2
Immediate Reinforcement	3	2	3	4	2	1	7	4	4
Operant Therapy	7	1	1	5	2	1	12	3	2
Non-Directive Therapy	4	3	2	3	4	1	7	7	3
Psychoanalytic Therapy	3	4	2	4	4	0	7	8	3

A sign test procedure was applied to the data. The changes in attitude toward negative reinforcement, modeling, and partial reinforcement were significant for either one or the other of the groups or for the combined data. The change towards a more accepting attitude for operant therapy was also significant for both groups and for the combined data.

Several tests of the differences between the aduio and video groups were conducted, but no significant differences were found. Although the singificance levels in Table 5 would tend to indicate more shift in the audio group subjects, the trend is not statistically sitnificant. In both groups, 50% to 59% of the changes were toward more positive evaluation of the concept with no large, consistent trend in favor of the audio group.

Table 5

Significance Level of Changes in Attitude Toward Various Concepts

	Significance of Change*		
Concept	Audio	Video	Both
Negative Reinforcement	.05	.01	.01
Positive Reinforcement	N.S.	N.S.	N.S.
Modeling	.01	N.S.	.01
Partial Reinforcement	.01	N.S.	.01
Immediate Reinforcement	N.S.	N.S.	N.S.
Operant Therapy	.01	.10	.01
Non-Directive Therapy	N.S.	N.S.	N.S.
Psychoanalytic Therapy	N.S.	N.S.	N.S.

* Based on Sign Test

Report of Changes in Cognitive Knowledge of Learning Theory.

The test of learning theory knowledge was administered at the beginning of the Fall Quarter and at the end of the Winter Quarter. One of the investigators scored the responses using a 0-5 scale. The average scores obtained on each of the seven terms listed in the test

are shown in Table 6. "Operant" was the concept least understood, and "Partial Reinforcement" was next. "Tangible Reinforcer" and "Verbal Reinforcer" were consistently the most easily defined concepts. After two quarters of academic and practicum work, one quarter of which included self-confrontation, knowledge of all the concepts increased, although they tended to maintain their rank order. A rank order correlation of 0.96 ($p < .01$) was obtained between the concept ranks before and after treatment.

Table 6

Average Scores Before and After
Videotape and Behavior Feedback Training
on Seven Learning Theory Concepts

Concept	Average Score* Before Training	After Training
Base Rate	2.44	3.81
Partial Reinforcement	1.38	3.56
Reinforcement Schedule	3.31	4.69
Social Reinforcement	2.18	4.31
Operant	0.75	1.75
Tangible Reinforcer	4.06	5.00
Verbal Reinforcer	4.13	5.00

* Maximum possible score = 5

The number of clinicians who received a higher score, or a lower score, were tabulated for each concept as shown in Table 7. All of the concepts, with the exception of "Operant," showed a significant number of increases. Actually, the shift in definitions of "operant" could have occurred with a $p < .10$ so that it just missed significance.

Table 7

Changes in Scores Before and After Confrontation and Behavior Feedback Training on Seven Learning Theory Concepts

Concept	Increases in Score	Decreases in Score	No Change in Score	Sign Test Significance*
Base Rate	8	1	7	.01
Partial Reinforcement	11	1	4	.001
Reinforcement Schedule	8	2	6	.05
Social Reinforcement	10	4	2	.05
Operant	5	2	9	N.S.
Tangible Reinforcer	6	0	10	.05
Verbal Reinforcer	5	0	11	.05

* Based on values in Table D, p. Siegel, Nonparametric Statistics.

Analysis of the magnitude of change for each concept is instructive. The absolute level of increase is shown in Table 8. Smallest increases occurred for "Tangible Reinforcer" and "Verbal Reinforcer," and the largest were for "Partial Reinforcement" and "Social Reinforcement." These findings are a little deceptive because the largest possible score was a "5", and a concept with an initial average score near "5" would show relatively little change. A correction procedure was employed which expressed change as a percentage of the available change. Under these conditions, "Tangible Reinforcer" and "Verbal Reinforcer" exhibited the largest change and "Operant" and "Base Rate" the smallest.

Table 8

Absolute Change in Score and as a Percentage of Possible Change in Score for Seven Learning Theory Concepts Before and After Confrontation and Behavior Feedback Training

Concept	Absolute Increase	Percentage Increase
Base Rate	1.37	54%
Partial Reinforcement	2.18	60
Reinforcement Schedule	1.38	82
Social Reinforcement	2.13	68
Operant	1.00	24
Tangible Reinforcer	.94	100
Verbal Reinforcer	.87	100

Definitions were not the only part of the learning theory test. Each clinician classified a series of reinforcers as tangible, social verbal, or social nonverbal. No change scores could be obtained on the classification part of the test because 90% of the clinicians missed none of the items, and the other 10% missed only one item. Consequently, no meaningful improvement scores could be obtained.

Report of Interview Responses at the End of the Project.

After data were analyzed at the conclusion of the experimental phase of the project, interviews were scheduled with individual subjects. Data specific to each clinician, such as his positive reinforcer ratios for each therapy session, were interpreted by the Project Director. While each interview was individualized in its reporting back to the clinician various data specific to tht clinician, the interview focus was on obtaining clinician views on their audiotape or videotape confrontation experiences.

There was a general consensus among interviewees that they found the audiotape and videotape confrontation helpful to them as clinicians. They were particularly enthusiastic about the therapy matrix which

gave them a framework with which to hear or view their own therapy sessions. Most of the clinicians stated that they wished they had more than the eight week exposure of confrontation and more than a five minute segment of their therapy available for self-study. Several clinicians complained about the experimental design of the project which limited their viewing to a five minute randomly selected segment of therapy; these people stated that they wished that they would have had the opportunity of selecting particular segments of their therapy sessions for their own self-study. All interviewees concluded that the methods developed studying oneself in therapy would have much application in real world clinical settings.

The audiotape confrontation subjects generally expressed the wish that they had been in the videotape group with one subject commenting, "I think just hearing the session prevents you from really getting a feel of the whole session." Another audiotape subject stated, also, that the auditory playback "misses so much of the therapy," explaining that much of her reinforcement was non-verbal (touching hands, nodding, smiling, frowning) and could not be recognized on audiotape playback; therefore, she felt that the positive and negative reinforcer ratios for her obtained by analyzing audiotape playback would be grossly inaccurate. Audiotape subjects generally agreed that while they may have missed the many visual aspects of the therapy studying the audiotape playback did enable them to "relive" the therapy session and appreciate more fully the behavioral interaction between them and their clients. Without using the therapy matrix as a guide to their listening observations, however, the subjects felt that just listening to audiotaped segments of their therapy would not tell them very much. The added structure of listening for specific kinds of events appears to make the listening experience far more worthwhile.

For those subjects who experienced videotape confrontation, a frequent observation was that during the first taping sessions the subject was self-conscious at seeing himself. This self-concern reportedly diminished with subsequent viewings. One clinician said, "It would have been a more useful experience if we watched the tapes with our therapy supervisor. He could then view a sequence, stop the tape, and ask us why we did what we did." Another clinician reported that she was so busy filling out the therapy matrix form while the therapy tape was being shown that she found herself studying the form and not viewing the monitor, functioning very much as if she were listening to an audiotape. One of the reported features of the videotape experience was that the clinicians by video watching became acutely aware of their use of non-verbal reinforcement in therapy, with one clinician remarking, "I didn't realize that I smiled so much."

Most of the interviewees reported that they wished they could have had more audiotape or videotape confrontation. When told that student clinicians next year would use confrontation as intensively as they felt they needed it, this year's subjects generally stated they wished they had had that opportunity.

Summary of Findings.

There were six basic change measures employed in the study: the survey of congitive knowledge of learning theory, the semantic differential on selected concepts, the recording of reinforcer ratios, the self-concept Q-Sort, the self-concept semantic differential, and the self-confrontation questionnaire. The first three of these measures showed a definite change from pre-test to post-test or from initial session to final session. The other three tests provided mixed results. None of the tests showed a consistent difference between the video and audio conditions. The results are summarized in Table 9.

Table 9
Summary of Results

	AUDIO (Pre-Post Change)	VIDEO (Pre-Post Change)	AUDIO VS. VIDEO (Difference Between)
Cognitive Knowledge	Yes	Yes	No
Semantic Differential	Yes	Yes	No
Behavior Change	Yes	Yes	No
Self-Concept: Q-Sort	No	Yes	No
Self-Concept: Questionnaire	No	No	No
Self-Confrontation Questionnaire	No	No	No

CONCLUSIONS

Both audiotape and videotape self-confrontation were found to be useful methods in training speech and hearing clinicians. Our data and experience using these confrontation methods seem to tell us that the mere listening to an audiotape or the viewing of a videotape is not nearly as powerful a training device as listening-viewing with some kind of structure, such as is provided by using a therapy analysis matrix. The matrix when applied with an audiotape or videotape playback allows the clinician the opportunity of dissecting his previous therapy. He can then determine his behavioral effects on client responses, client effects on clinician behavior, and the overall effectiveness of the total therapy session. Such audiotape and videotape confrontation has also been found to be most useful in plotting over time the interaction dynamics between clinician and client.

In the FINDINGS AND ANALYSIS section of this report the reader will find the data, graphs, and statistical meanings of the various change measures employed in this study. The results of these change measures and an interpretation of the significance of these findings will be summarized under each of the four project questions formulated at the beginning of this study. We shall consider each question separately.

Question #1. <u>Are videotape self-confrontation (single and double confrontation) procedures practical and efficient methods of improving the self-awareness of developing speech clinicians?</u>

It should be pointed out initially that as a result of our first year project analysis there were little differential effects between single and double videotape confrontation. Double confrontation was found to be more effective for the occasional subject whose initial self-concept was relatively low when compared with other clinicians. For the average student clinician, however, the single conforntation experience was found to be as adequate as the double experience. Because of the heavy involvement of equipment under the double confrontation situation (two video recorders, two monitors, one camera) it was decided during the second year of the project to employ only the single confrontation methodology for those subjects in the videotape confrontation group. All subjects in the video group reported real enthusiasm for the video exposure, generally voicing the wish that they had received more opportunities to view themselves on videotape more often.

Single videotape confrontation was provided each subject once weekly for a period of eight weeks. In this brief time, the subjects demonstrated a significant change in their ideal-actual concepts of the ideal speech clinician, as measured by pre-and post-sorts of

the Denver Q-Sort. In the pre-sort, subjects were found to have a much higher ideal than where they thought they actually were. At the end of confrontation, the actual and ideal sorts converged, with the ideal dropping a bit with the actual rising. This convergence of actual-ideal suggests that intense videotape confrontation exposure will result in a clinician modifying his actual clinical concept to more closely conform to his ideal clinical concept. This finding is contrary to the results obtained in the first year of the project and leaves a rather confused picture of ideal-actual convergence under videotape confrontation. In concert with several other investigators, we must conclude that VTR self-confrontation does not have a strong consistent effect on self-concept relative to an ideal. Analysis of self-confrontation questionnaires which were designed to measure the subject's feelings about the experience indicate that videotape subjects (as well as audiotape subjects) felt the experience to be highly profitable. Rating scores indicate that initial therapy sessions are usually rated lower in effectiveness than subsequent ratings; ratings given after each session towards the end of the eight week exposure were usually the most favorable ratings obtained. It would appear that some subjects are bothered a bit initially at studying themselves on videotape, but soon they begin to study the overall therapy session more than the specific dimensions of self. Most subjects felt their use of positive and negative reinforcers with their clients were effective and that by studying themselves on videotape, they became aware, often for the first time, of how effective they really were as clinicians.

Videotape confrontation methodology is easy to employ. Students have demonstrated their ability to learn the matrix accurately and appropriately in slightly less than an hour. By using the therapy matrix, the student receives some focus on what to look for. Stoller (1966) makes an important distinction in self-confrontation: there is a difference between focused and unfocused feedback in self-confrontation. Unfocused feedback occurs in the situation in which the trainee is allowed to look at any portion of the recording. In focused feedback, the supervisor or trainer provides a specific way of perceiving the recording, such as employing our therapy matrix analysis while viewing a videotape replay. This leads to the simple paradigm as shown in Figure 13.

Under focused feedback, we can make an additional distinction between verbal and nonverbal behaviors. The supervisor must decide which kind of behaviors are important in a given training situation and then focus on these behaviors. If he focuses on verbal activities, audio confrontation can be just as effective as video confrontation. A basic finding of the present study is that while videotape has been found to be most useful in studying the whole therapy session, audiotape is equally effective in studying the verbal dimensions of therapy.

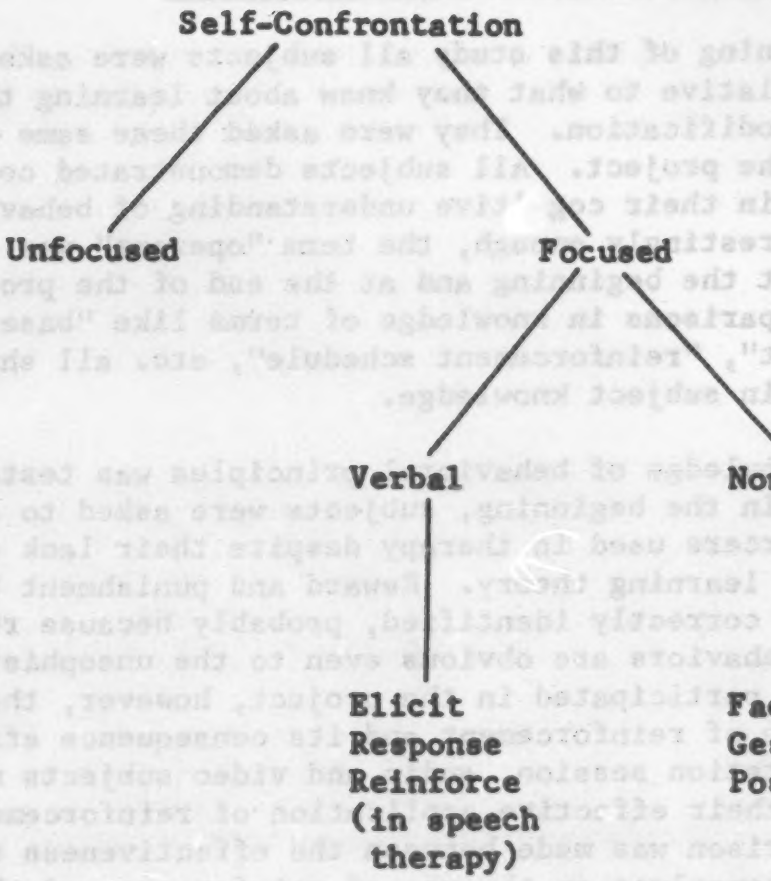


Figure 13

A Paradigm of the Self-Confrontation Situation

Question #2. <u>Does the dissection of therapy segments through self-confrontation provide the student clinician insights into better use of operant methodologies in his therapy, as compared to conventional methods of developing these skills?</u>

In the beginning of this study all subjects were asked specific questions relative to what they knew about learning theory and behavioral modification. They were asked these same questions at the end of the project. All subjects demonstrated considerable improvement in their cognitive understanding of behavioral terminology. Interestingly enough, the term "operant" was the least understood at the beginning and at the end of the project. Pre- and post-comparisons in knowledge of terms like "base rate", "partial reinforcement", "reinforcement schedule", etc. all showed significant improvement in subject knowledge.

Practical knowledge of behavioral principles was tested throughout the study. In the beginning, subjects were asked to classify their reinforcers used in therapy despite their lack of formal knowledge of learning theory. Reward and punishment behaviors were usually correctly identified, probably because reward and punishment behaviors are obvious even to the unsophisticated. As the subjects participated in the project, however, they became acutely aware of reinforcement and its consequence effects. After each confrontation session, audio and video subjects made judgements specific to their effective application of reinforcement. An interesting comparison was made between the effectiveness ratings clinicians gave themselves on the use of reinforcers and the actual reinforcer ratios that were measured by the project investigators. These self-determined ratings and actual computed reinforcer ratios were found to be quite similar. There were no differences in reinforcement ratios between the two experimental groups; of real interest was the finding that neither group changed much in its overall use of positive reinforcement. Negative reinforcement, however, increased markedly with continuing confrontation experience and pre- and post-comparisons in the use of negative reinforcement found it to increase significantly at the .001 level.

It should be mentioned that in this project the term negative reinforcement is used as the term "punishment" is traditionally used. That is, a negative reinforcement (a frown, "no", "try it again", negative shaking of the head) would have the classical punishing effects of diminishing a response. Student clinicians in the beginning of their training were somewhat reluctant to say "no". They avoided using negative punishers. It appeared that with training they employed methods of rejecting incorrect verbal and nonverbal behaviors in their therapy at much higher levels than they did early in therapy. Application of confrontation methods with experienced clinicians has also identified a much higher negative reinforcement ratio than can be generally observed with beginning clinicians.

Studying one's effects by either audiotape or videotape confrontation appears to be an excellent method of learning both the theoretical and practical aspects of behavioral modification.

Question #3. Is audiotape as effective as videotape for studying both oneself and what one does in therapy?

When the present investigators in the first year of the project found videotape confrontation to be a powerful training experience for student speech and hearing clinicians, the question was then asked if audiotape confrontation would be as effective. All subjects in the present investigation were videotaped during speech therapy; however, for the audio group subjects there was no videotape playback provided, with each subject only hearing his therapy session by listening to the audiotrack of the videotape recording. The trainers were able to view as well as hear the therapy session for purposes of computing reinforcement ratios, checking out what the subject missed by not also viewing his playback, etc. The same therapy matrix form was used with the audio subjects that had been developed for video confrontation.

The results of our study indicate that audiotape confrontation, when combined with behavioral scoring, is as effective as videotape confrontation in changing verbal behaviors. Two years of recording and analysis of therapy sessions have shown us that eighty to ninety-five percent of the therapy process occurs at the verbal level. Therefore, audiotape is equally effective in identifying these portions of therapy. Our findings about audiotape do not imply that videotape confrontation is not more effective or useful in studying therapy. The findings seem to indicate that videotape procedures should probably concentrate more on nonverbal behaviors as added information specific to the therapy session.

Our experience and the information found in the literature point to at least three major areas where nonverbal cues are important. First, facial expression and gestural cues are used to modulate (amplify or attenuate) reinforcers. Any training of clinicians in the area of reinforcement procedures should eventually include feedback on modulation of reinforcers. This feedback would concentrate on facial expression, gestures, and posture -- the type of behaviors that could only be studied on videotape.

Attending to the client is a second area in which nonverbal cues are important. Eye contact and posture are the primary signals (positive reinforcers) which establish the fact that "I am listening". To improve a clinician's ability to be interested and responseive, videotape self-confrontation would be important. Finally, nonverbal behaviors are used to punctuate therapy interaction. Clinicians typically use a postural shift or gesture to indicate the end of one kind of activity and the beginning of another. Again, this kind of activity can be perceived only when visual cues are recorded and played back.

It would appear that subjects who were confined to audiotape confrontation, with no opportunity for studying their therapy on video playback, made significant changes in their cognitive knowledge of learning theory and in their ability to apply learning theory principles effectively in therapy. Since the majority of events in speech therapy sessions are verbal, the audiotape subjects were able to classify the appropriateness of their use of reinforcers as effectively as the videotape subjects. Several audio subjects complained, however, that much of their use of reinforcement was nonverbal and they were unable to recognize any of these by only the audio playback. The audio subjects did feel that scoring their therapy sessions by audiotape confrontation did enable them to "relive" the session and experience once again the inner experiences they felt during the session. The overall sequence of events within the segment analyzed seemed to be correctly identified with the only omissions generally found to be nonverbal behaviors of both clinician and client.

Whenever the audio and video groups were compared on basic change measures employed in this study, there were no significant differences found between the two groups. Such a finding seems to mean two things to the investigators: one, there is much that goes on in clinical training that the student in each group experiences outside the confrontation experiences which contributes to a significant change in his therapy behaviors over time, and two, audiotape confrontation can be a most useful device in developing in clinicians an awareness of what goes on in their therapy sessions. Audiotape has a real place in the self-study of the verbal behaviors of a therapy session. Videotape seems to provide all that audiotape can, plus the important information relative to nonverbal behaviors.

Question #4. <u>Can supervisors be trained to employ videotape derived matrices developed in the first year of the project and employ them as supervisors with student clinicians</u>?

In the first year of this project, Boone and Goldberg (1969) reported the use of a ten category system developed by Stech (1968) which subjects employed in analyzing their therapy sessions during videotape confrontation. This ten category matrix was employed during the second year described in this report. All experimental subjects, both the audio and video groups, have been taught to use the category system accurately and reliably in relatively little time. As described in the METHODS section of this report, after baseline date were taken, subjects were instructed in the use of the category system by viewing a five minute training tape, coupled with the instruction of the Project Coordinator. Subsequent to this training experience, subjects began to score five minute segments from their own therapy sessions. Reliability of subject scoring is reported in the METHODS section. Validity of matrices application may be seen in the high level of agreement in scoring between subjects who view their tapes once as

compared with trainers who extract the same information after repeated measurements and observation. The therapy matrices appear to be valid graphic representations of what may be seen by listening to or viewing therapy tapes; the matrix also graphically describes "live" therapy sessions. Since the matrix is basically a graphic way of ordering the sequence of events in therapy, it preserves in graphic sequence any therapy session to which it is applied.

In a related study to this one, Prescott (1970) developed a nineteen category system for use in scoring speech and hearing therapy sessions. He expanded the Stech system by describing the mode of stimulus (such as auditory or visual presentation) and the mode of response (such as speech or gesture). Prescott's study reported high reliability between his judges and between his subjects in learning the category system and applying it to therapy sessions. The ease at which student clinicians can learn to use matrices in scoring their therapy sessions, using both the Stech (1968) and the Prescott (1970) systems, suggests their ready application by supervisors in training speech and hearing clinicians. (See Appendix E.)

Because of the relative ease in learning to use these category systems, the investigators now feel that many students would profit well from self-supervision. That is, the student is taught to use a therapy analysis matrix using either audiotape or videotape as his playback mechanism. He then is audiotaped or videotaped during his therapy. The student then studies his own playback immediately after the session or at a later time by employing the therapy category matrix. By computing his own positive and negative reinforcer ratios, by observing the particular sequence of events within the therapy session, by studying his own performance as a clinician, by studying the performance of the client, the clinician develops his own awareness of his abilities.

Both student clinicians and supervisory staff have shown real enthusiasm in employing the therapy matrix for studying therapy. As a result of our past project involvement in audiotape and videotape confrontation, it is now our plan to disseminate project methodologies and results in the form of a book and to develop training tapes and workbooks for utilizing therapy matrices.

In summary, audiotape and videotape confrontation both were found to be effective methodologies to use in the training of speech and hearing clinicians. Since the great majority of events within a speech therapy session is verbal in type, the audiotape playback will enable the clinician during confrontation playback to recognize the sequence of verbal events within the segment of therapy to be analyzed. With videotape confrontation the clinician gets the verbal feedback of his clinical session as well as the important nonverbal information (gesture, posture, etc.). By using a therapy

matrix for scoring one's therapy session on either audiotaped or videotaped playback, the student is able to develop accurate insights relative to his function as a person and his demonstrated capability as a clinician. This method is applicable to clinical sessions regardless of their philosophical basis; i.e., operant, nondirective, etc.

We might well add the audiotape recorder as a useful confrontation device in training clinicians. Audiotape confrontation further provides a useful and needed device for ongoing self evaluation by practicing clinicians. Audiotape recorders are readily available to most speech clinicians and thus may be employed at no additional cost and with a minimum of additional time expenditure. Both audiotape and videotape confrontation could have important utilization in the training of professional personnel to work with the handicapped. By adding audiotape replay confrontation (ATR) to the text every time it says videotape replay confrontation (VTR), this quote from the previous annual project report (Boone and Goldberg, 1969) appears even more applicable.

> What are some of the specific areas other than clinical speech training where the VTR self-confrontation approaches developed and tested in this study might be used? It could be employed to prepare students in many of the traditional and more modern specialties identified with the speech communication disciplines, such as public speaking, debate, discussion, group communication, interpersonal communication, sensitivity training, interviewing, and the like. It could be helpful in clinical training curricula outside the speech pathology area, including programs in clinical psychology, vocational rehabilitation, counseling, psychological testing, and psychodrama.
>
> VTR self-confrontation methods could improve the training of teachers, social workers, and administrators. It could help students prepare for careers in public relations, television, politics, and any other vocation that requires a good understanding of self and an ability to work effectively with others.
>
> The self-confrontation techniques refined in this investigation could conceivably enhance the training of medical students by helping them improve both their technical skills as well as their ability to interact therapeutically with patients. It could also be used to train others in the medical area, including nurses and hospital administrators.

2

The implications of VTR self-confrontation for management training have been recognized by many industries. Often, however, the approach is used in a haphazard and undisciplined way. The present investigation offers a systematic approach to VTR self-confrontation and provides some insight into its appropriateness for various purposes, such as personnel interviewing, appraisals, and the like.

VTR self-confrontation might be of value in training the disadvantaged. A major goal of many job training, youth opportunity, and similar programs is to help the trainees develop more self confidence, a more positive self-image, interpersonal awareness, and other skills that could possibly be developed through VTR self-confrontation.

The videotape recorder is a relatively new piece of educational hardware. In recent years it has become an important part of the educational scene. It is being used at a number of institutions in the training of teachers, counselors, clinical psychologists, medical doctors, lawyers, speech therapists and public speakers. It is also employed extensively by industry for in-service training purposes. However, very little of a scientific nature is known about alternative ways to use the videotape recorder or its relative effectiveness. The present study represents one of the few systematic attempts to develop a specific VTR methodology for self-confrontation and to test its effectiveness. The findings are encouraging. They suggest that VTR self-confrontation is a practical and feasible educational methodology and that its effects can be distinguished from more traditional educational approaches. The study lends further support to the age-old dictum that true learning begins with self-knowledge and understanding.

APPENDIX A

QUICK ANALYSIS METHODS FOR CONTINUOUS INTERACTION SCORING IN SPEECH THERAPY

VIDEOTAPE/AUDIOTAPE
SELF-CONFRONTATION PROJECT

GRANT OEG-0-9-071318-2814

July, 1969
Denver, Colorado

Ernest L. Stech, Ph. D.
Videotape Project Coordinator
Speech and Hearing Center
University of Denver

Introduction

Interaction recording of therapy process can be a valuable training tool when used as feedback to the clinician. However, interaction recording can be a tedious, time consuming process, and the analysis of the resulting interaction record can be even more tedious and time consuming. The purpose of this paper is to outline a Quick Analysis Method for handling interaction records of speech therapy sessions. Methods for improving the recording process itself will be discussed elsewhere.

The category system used for interaction recordings at the University of Denver Speech and Hearing Center is based upon a operant conditioning approach (see Stech, 1968; Boone and Goldberg, 1969). This report discusses three kinds of behavior rates or ratios which prior research and experience have shown to be important.

(1) the reinforcement schedules or ratios,
(2) the correct response ratio, and,
(3) the inappropriate response ratio.

The operationalizations of these measures and some of their implications are discussed in detail in subsequent sections of this report.

Quick Analysis Versus Detailed Analysis Procedures

A category scoring system can be used for research and training purposes. Although a research worker must be concerned with the time and effort involved in data reduction, the trainer is faced with extreme requirements for speedy and effective information feedback to the trainee. During videotape self-confrontation, the clinician's behaviors should be converted to meaningful measures so that he can change them in the proper direction. This means that behavior must be categorized easily and rapidly. The therapy situation also requires that the sequence of behaviors be preserved. It also requires that sequences be easily and rapidly analyzed. In essence, quick analysis procedures allow simple and rapid feedback to the trainees in a form which will permit subsequent behavior change.

The Category System

The ten category, learning theory based scoring system has been presented elsewhere (Boone and Goldberg, 1969; Stech, 1968). It is repeated here in its bare essentials for completeness of this manual. Detailed descriptions of the categories and discussion of categorization techniques can be found in the eariler publication on this method.

Table 1 shows the ten categories with a brief description of each. The first five categories relate to clinician behaviors, and the second five involve client behaviors. Major emphasis in the system is on how the client responds (correctly, incorrectly, or inappropriately) to clinician direction (explanation or models), how the clinician reinforces correct or incorrect client responses, and how the clinician handles inappropriate client responses.

Table 1

Category Number	Title	Brief Description
1	Describe, explain	Therapist elicits client behavior by description, explanation or by direct control
2	Model	Therapist elicits client behavior by direct and conscious modelling
3	Positive reinforcement	Therapist positively reinforces the client, either verbally or non-verbally
4	Negative reinforcement	Therapist negatively reinforces the client, either verbally of non-verbally
5	Neutral and Social	Therapist engages in activities which do not require client response or which deal with session goals
6	Correct responses	Client makes a response which is correct in terms of the therapy goals
7	Incorrect responses	Client makes a response which is incorrect in terms of the therapy goals
8	Inappropriate and Social	Client makes a response which is not appropriate in terms of the therapist's goals or engages in social conversation not related to the therapy goals.
9	Positive self-reinforcement	Client positively reinforces himself by verbally or nonverbally indicating that he considers his response correct
10	Negative self-reinforcement	Client negatively reinforces himself by verbally or nonverbally indicating that he considers his response incorrect

The Basic Categorization and Analysis Operations

The standard method of continuous interaction scoring employed at the University of Denver Speech and Hearing Center is shown in Figure 1. A continuous line is drawn across the scoring chart. Each short horizontal segment (which may also be a point, dot, or other indicator that a behavior occurred in that category) represents a single behavior of a specific type. This method of categorization is fast and efficient, and if a form similar to the one shown after Figure 1 is used, the method results in a minimum number of pieces of paper since one sheet suffices for 20 to 30 minutes of therapy.

Ratio and sequence scoring, using the Quick Analysis Methods, requires the following operations after categorizations is complete:

(1) Sum the number of acts in each category by counting from left to right the number of horizaontal line segments, points, dots, or or other marks in each now fo the scoring sheet. Totals are shown at the right hand edge of Figure 1.

(2) Count the number of times a category 6 act is followed by a category 3 act. These events are indicated by a x in Figure 1.

(3) Count the number of times a category 7 act is followed by a category 4 act. These events are indicated by a * in Figure 1.

(4) Count the number of times a category 8 act is followed by a category 1 or 2 act. These events are indicated by an "a" in Figure 1.

(5) Count the number of times a category 8 act is followed by a category 3 or 4 act. These events are indicated by a "b", but none of these events occurred in the scoring shown in Figure 1.

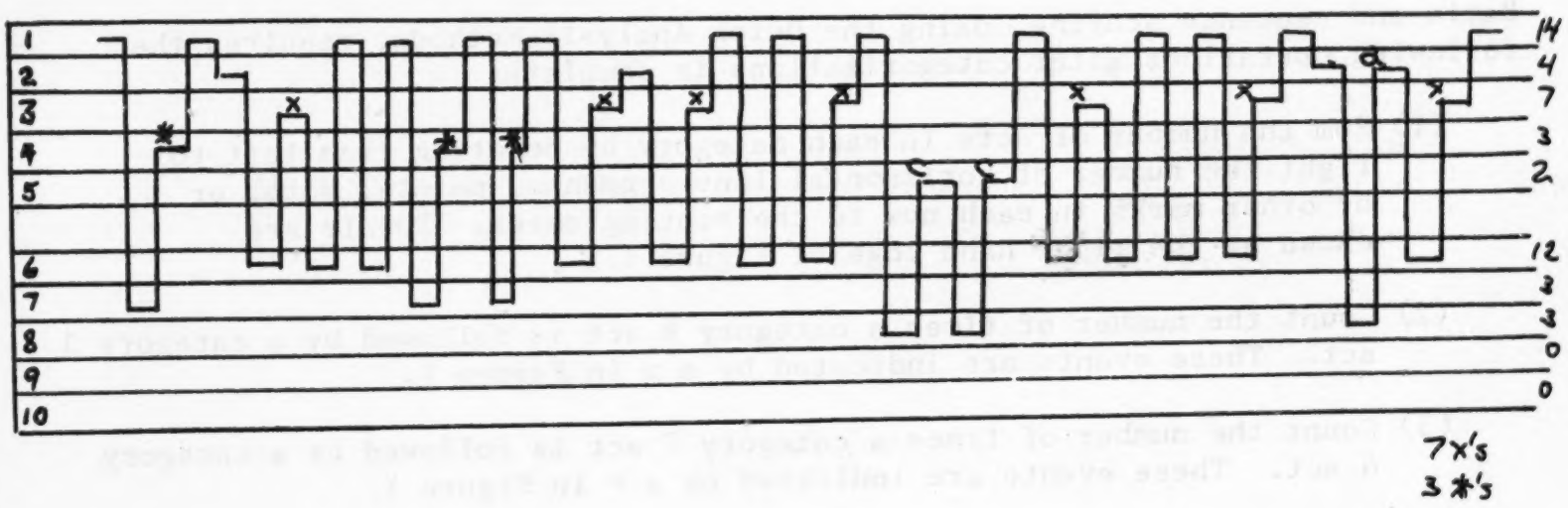
(6) Count the number of times a category 8 act is followed by a category 5 act. These events are indicated by a "c" in Figure 1.

The six operations just outlined constitute all the basic quantities needed in Quick Analysis Scoring.

The Quick Analysis Scoring Form which is included after the categorization form, allows rapid calculation of the various behavior rates and sequences discussed in this manual. The row totals from the categorization form plus the sequence totals are entered as shown. The seven ratios can then be calculated using the worksheet blanks. Each of these ratios is discussed in more detail in the ensuing sections of this manual so that no further explanation will be given here.

Figure 1

An Example of Continuous Sequence Scoring of Therapy Interaction



Quick Analysis Scoring Form

Clinician:_____ **Date:**_____

Client:_____ **Trainer:**_____

Category Counts

Category	No. of Occurrences
1	___
2	___
3	___
4	___
5	___
6	
7	___
8	___
9	___
10	___

Sequence Counts

Sequence	No. of Occurrences
6/3	___
7/4	___
8/1,2	___
8/3,4	___
8/5	___

Positive Reinforcement Ratio: $\frac{6/3}{6}$ = ___ = 0 ___ ___

Negative Reinforcement Ratio: $\frac{7/4}{7}$ = ___ = 0 ___ ___

Correct Response Ratio: $\frac{6}{6+7}$ = ___ = 0 ___ ___

Inappropriate Response Ratio = $\frac{8}{6+7+8}$ = ___ = 0 ___ ___

Directive Control Ratio = $\frac{8/1,2}{8}$ = ___ = 0 ___ ___

Reinforcement Control Ratio = $\frac{8/3,4}{8}$ = ___ = 0 ___ ___

Personal Social Control Ratio = $\frac{8/5}{8}$ = ___ = 0 ___ ___

Reinforcement Ratio Analyses

Reinforcement ratios are particularly profitable behavior measures to study in therapy. The rate of reinforcement can be controlled readily by the clinician, and it has a major effect on client performance. Two ratios are of particular interest:

(1) the positive reinforcement ratio:
the ratio of correct responses which are positively reinforced

(2) the negative reinforcement ratio:
the ratio of incorrect responses which are negatively reinforced.

Prior research has shown that there ratios are related to clinician personality and to the amount of prior clinical experience of the clinician.

A third ratio is available:

(3) the reinforcement efficiency ratio:
the ratio of all reinforcements to those used immediately after correct or incorrect responses

This measure is useful in determining the degree to which reinforcements are "wasted" on behaviors which should be handled in some other fashion.

Positive Reinforcement Ratio

The positive reinforcement ratio is found in this way:

(1) count the total number of correct responses by the client (Category 6)

(2) count the number of correct responses followed by a positive reinforcement (Category 6 followed by Category 3)

(3) divide the total number of correct responses into the number of correct responses which were positively reinforced; the result is the positive reinforcement ratio

This ratio typically is in the range from .60 to .95 with a mean around .80 for most therapists. High rates of reinforcement are associated with outgoing and experienced clinicians. The positive reinforcement ratio is resistent to change (Boone and Goldberg, 1969).

Negative Reinforcement Ratio

The negative reinforcement ratio is found in this way:

(1) count the total number of incorrect responses by the client (Category 7).

(2) count the number of incorrect responses followed by negative reinforcements (Category 7 followed by Category 4).

(3) divide the total number of incorrect responses into the number of incorrect responses followed by negative reinforcements; the result is the positive reinforcement ratio.

This ratio can range from .00 to 1.00. The negative reinforcement ratio can be increased as a result of training. (Boone and Goldberg, 1969).

Reinforcement Efficiency Ratio

The reinforcement efficiency ratio is found in this way:

(1) count the total number of reinforcements, positive and negative, given by the clinician

(2) count the number of positive reinforcements following correct response and the number of negative reinforcement following incorrect responses and add them together

(3) divide the quantity found in (2) by the value in (1); the result is the reinforcement efficiency ratio

This ratio indicates the degree to which the therapist gives positive and negative reinforcements for behaviors other than correct or incorrect behaviors. Reinforcements given for inappropriate or peripheral behaviors may serve to satiate the client without affecting the communication behaviors under treatment, and such reinforcements are considered, as a result, inefficient and wasteful.

Correct Response Ratio Analysis

The correct response ratio is an important behavior measure for the clinician. The quantity of correct responses by the client is to some extent under the control of the clinician. A large number of correct responses make a client feel as though he is doing well. A small number may be discouraging and anxiety-inducing.

The correct response ratio is fairly simple to measure and understand. It is:

(1) the percentage of all client responses which are considered correct or acceptable to the clinician.

Based on current research, the correct response ratio varies from 60% to 90%.

If the correct response ratio is too high, the chances are that the level of difficulty of the material is too low and the client is learning at a less than optimum rate. On the other hand, a correct response ratio which is too low will result in frustration and anxiety for the client. Feelings of failure and lack of progress may inhibit further learning.

A clinician can control the correct response ratio for certain clients through the selection of materials or procedures in therapy. However, this correct response ratio is also a function of the client's problem. For example, severe stuttering and tension-related voice problems result in virtually 100% incorrect responses. Yet, mildly delayed language development or almost completed articulation therapy will result in nearly 100% correct responses. The base rate of correct responses, therefore, is determined by the type of disorder and by the clinician's choice of task for the client. From the standpoint of changing therapeutic behaviors, only the portion of the correct response ratio which can be influenced by clinician decisions is important.

Correct Response Ratio

The correct response ratio is found in this way:

(1) count the total number of correct responses by the client (Category 6)

(2) count the total number of incorrect responses by the client (Category 7)

(3) add the total number of correct and incorrect responses (Categories 6 and 7) and divide into the number of correct responses; the result is the correct response ratio.

This ratio will vary with the kind of clients and the form of communication disorder. However, the ratio tends to fall between 60% and 90% for most clients.

Inappropriate Response Ratio Analysis

The inappropriate response ratio is important with certain types of clients, particularly the severely retarded and the emotionally disturbed. An inappropriate response ratio above 10% is usually an indicator of problems with the client-clinician communication or relationship. Either the clinician is communicating poorly the intent and goal of the session or the client is a particularly resistant, impervious, or withdrawn individual.

The inappropriate response ratio is:

(1) the percentage of all client responses which are considered inappropriate in terms of the behavior desired of the client and the therapy goals.

This ratio may vary from less than 1% to 30% or more.

If the inappropriate response ratio is below 10% there is no need for further analysis in this area. When the ratio exceeds 10% it may be profitable to evaluate how the clinician is handling the inappropriate responses. The sequences can be identified: control by task orientation, control by reinforcement, and control by social/personal reference. These types of control can be measured in these ways:

(1) Control by task orientation is the percentage of inappropriate responses which are followed by additional eliciting behaviors by the clinician.

(2) Control by reinforcement is the percentage of inappropriate responses which are followed by negative reinforcement.

(3) Control by social/personal reference is the percentage of inappropriate responses which are followed by clinician discussion of or response to the inappropriate act.

Inappropriate Response Ratio

The inappropriate response ratio is found in this way:

(1) count the total of correct responses by the client (Category 6)

(2) count the total of incorrect responses by the client (Category 7)

(3) count the total of inappropriate responses by the client (Category 8)

(4) sum the totals of correct, incorrect, and inappropriate responses (Categories 6,7, and 8)

(5) divide the total number of inappropriate responses by the total number of correct, incorrect, and inappropriate responses; the result is the inappropriate response ratio

The ratio typically ranges from .01 to .40 based on current but limited research. High inappropriate response ratios are seen most frequently among emotionally disturbed clients and the severely retarded. With children, inappropriate responses are sometimes associated with attempts to work past the child's attention span.

Control by Task Orientation Ratio

The task orientation ratio is found in this way:

(1) count the total number of innappropriate responses by the client (Category 8)

(2) count the number of inappropriate responses which are followed by explanation, description, or modelling (Category 8 followed by Category 1 and Category 2)

(3) divide the quantity found in (2) by the quantity in (1); the result is the task orientation control ratio.

Control by Reinforcement Ratio

The control by reinforcement ratio is found in this way:

(1) count the total number of inappropriate responses by the client (Category 8)

(2) count the number of inappropriate responses which are followed by negative reinforcement (Category 8 followed by Category 4)

(3) divide the quantity found in (2) by the quantity in (1); the result is the reinforcement control ratio.

Control by Social/Personal Reference Ratio

The social/personal reference ratio is found in this way:

(1) count the total number of inappropriate responses by the client (Category 8)

(2) count the number of inappropriate responses which are followed by social or personal comments (Category 8 followed by Category 5)

(3) divide the quantity in (2) by the quantity in (1); the result is the social/personal reference control ratio.

NOTE: If this ratio is a significant feature of the clinician's control of the client, the therapy tape would be replayed to ascertain exactly what forms of response the clinician was using. This procedure is recommended if the ratio exceeds 20%. It is particularly important to determine if the clinicians is inadvertently positively reinforcing the client with social/personal references.

1. Knows the value of negative reinforcement
2. Understands the significance of social reinforcement
3. Does not use tokens or similar items to reward desirable speech behavior
4. Have a comprehensive background in learning theory
5. Should not look upon himself as a psychotherapist
6. Prefers to work with organically based problems
7. Expresses himself well
8. Should be a specialist within his field
9. Can understand the articles in JSHR
10. Leaves diagnosis to the physician
11. Considers other things more important than personal appearance
12. Understands the techniques and issues of verbal conditioning
13. Has a neat and clean personal appearance
14. Is task oriented
15. Believes that actions are more important than verbal facility
16. Feels no need for special electronic equipment
17. Has comprehensive background in human anatomy and neurology
18. Reads professional journals
19. Need not be a good teacher
20. Is familiar with behavior modification techniques
21. Works more effectively with children than with adults
22. Is more interested in application than theory
23. Is flexible and openminded
24. Is sensitive to the needs of others
25. Maintains an appropriate professional relationship with his colleagues
26. Is a member of ASHA
27. Should consult with colleagues when uncertain
28. Should make referrals
29. Tries to avoid being evaluated by others
30. Shows empathy
31. Is well adjusted
32. Has a working knowledge in audiology
33. Has a low tolerance for ambiguity
34. Accepts objective criticism
35. Be mature
36. Be a good diagnostician
37. Feels little need for a background in child psychology
38. Be able to relate well with others
39. Feels little need to have a background in medical terminology
40. Feels little or no need to consult with colleagues
41. Is person oriented
42. Maintains social distance
43. Can work well with all age ranges
44. Can train clients to become more sensitive to their own needs
45. Is not too sociable
46. Be able to plan effective rehabilitation procedures
47. Is youthful
48. Uses negative as well as positive reinforcement
49. Promotes public awareness of the value and needs for speech therapy
50. Works independently without supervision

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51. Becomes involved with the personal problems of his clients
52. Enjoys seeing the results of therapy
53. Establish realistic goals for the client
54. Avoids making referrals
55. Dislikes being supervised
56. Understands human psychological reactions to illness
57. Have a good background in psychology
58. Have a sincere regard for the handicapped
59. Be able to work well with others
60. Is qualified as a psychotherapist
61. Uses a unisensory approach to therapy
62. Feels that ASHA certification is an irrelevant requirement
63. Has no business doing anything about a client's sensitivity to his own needs
64. Rewards the clients for good speech production
65. Feels a knowledge of anatomy and physiology is of little practical value
66. Have a stable personality
67. Have at least five years professional experience
68. Is professional in his dealing with others
69. Can converse intelligently with medical personnel
70. Is certified by the ASHA
71. Enjoys doing therapy
72. Is not concerned about the difference between apraxia, agnosia and aphasia
73. Have a masters degree in speech pathology
74. Can work well with both organic and functionally based problems
75. Collaborates with client in planning rehabilitation procedures
76. Can relate structure to function
77. Is familiar with behavior modification terminology
78. Believes that it is ability that counts, not professional experience
79. Allows client to establish his own goals
80. Is familiar with schedules of reinforcement
81. Appreciates the significance of "base rates"
82. Has a volatile personality
83. Uses a multisensory approach to therapy
84. Stresses therapy, not diagnosis
85. Tries to hide his embarrassments
86. Does not feel obligated to have perfect speech himself
87. Is not too introspective
88. Avoids impulsive responses like laughter
89. Believes that a clinician does not need to know psychoanalytic theory
90. Should stick to speech therapy and not personal problems
91. Sees little relationship between amount of study and clinical skills
92. Knows the significance of immediate reinforcement
93. Needs little background in audiology
94. Is not concerned with educating the public about the value of speech therapy
95. Avoids involvement with professional organization
96. Gets along well with others
97. Requires supervision
98. Is not overly concerned with the needs of others
99. Have an extensive background in psychoanalytic theory
100. Understands himself

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APPENDIX C

SEMANTIC DIFFERENTIAL QUESTIONNAIRE

Speech Pathology Concepts

Videotape Research Project
Speech and Hearing Center
University of Denver

Form A
August, 1969

INSTRUCTIONS

The purpose of this portion of the research project is to measure the meanings of certain concepts. In taking this test, please make your judgments on the basis of what the concept listed means to you. On each page of this booklet, you will find a different concept to be judged and beneath it a set of scales. You are to rete the concept on each of these scales in order.

Here is how you are to use these scales. If you feel that the concept listed at the top of the page is very closely related to one end of the scale, you should place your check-mark as follows:

fair :X :__:__:__:__:__:__: unfair

or

fair :__:__:__:__:__:__:X: unfair

If you feel that the concept is quite closely related to one or the other end of the scale - but not extremely - you should place your check mark:

fair :__:X :__:__:__:__:__: unfair

or

fair :__:__:__:__:__:X :__: unfair

If the concept seems only slightly related to one aide as opposed to the other side - but is not really neutral - then you should check as follows:

fair :__:__:X :__:__:__:__: unfair

or

fair :__:__:__:__:X :__:__: unfair

The direction toward which you check, of course, depends upon which of the two ends of the scale seem most characteristic of the concept you are judging.

If you consider the concept to be neutral on the scale, both sides of the scale equally associated with the concept, or if the scale is completely irrelevant, unrelated to the concept, then you should place your checkmark in the middle space:

fair :__:__:__:X:__:__:__: unfair

IMPORTANT!

(1) PLACE YOUR CHECKMARK IN THE MIDDLE OF THE SPACES - NOT ON THE BOUNDARIES

(2) BE SURE YOU CHECK EVERY SCALE FOR EVERY CONCEPT - DO NOT OMIT ANY

(3) NEVER PUT MORE THAN ONE CHECKMARK ON A SINGLE SCALE

Concept: NEGATIVE REINFORCEMENT or PUNISHMENT

good	:___:___:___:___:___:___:___:	bad
large	:___:___:___:___:___:___:___:	small
fast	:___:___:___:___:___:___:___:	slow
beautiful	:___:___:___:___:___:___:___:	ugly
strong	:___:___:___:___:___:___:___:	weak
active	:___:___:___:___:___:___:___:	passive
valuable	:___:___:___:___:___:___:___:	worthless
heavy	:___:___:___:___:___:___:___:	light
hot	:___:___:___:___:___:___:___:	cold

Concept: OPERANT THERAPY

good	:___:___:___:___:___:___:___:	bad
large	:___:___:___:___:___:___:___:	small
fast	:___:___:___:___:___:___:___:	slow
beautiful	:___:___:___:___:___:___:___:	ugly
strong	:___:___:___:___:___:___:___:	weak
active	:___:___:___:___:___:___:___:	passive
valuable	:___:___:___:___:___:___:___:	worthless
heavy	:___:___:___:___:___:___:___:	light
hot	:___:___:___:___:___:___:___:	cold

Concept: PARTIAL REINFORCEMENT

good	:	:	:	:	:	:	:	bad
large	:	:	:	:	:	:	:	small
fast	:	:	:	:	:	:	:	slow
beautiful	:	:	:	:	:	:	:	ugly
strong	:	:	:	:	:	:	:	weak
active	:	:	:	:	:	:	:	passive
valuable	:	:	:	:	:	:	:	worthless
heavy	:	:	:	:	:	:	:	light
hot	:	:	:	:	:	:	:	cold

Concept: CLIENT-CLINICIAN RELATIONSHIP

good	:	:	:	:	:	:	:	bad
large	:	:	:	:	:	:	:	small
fast	:	:	:	:	:	:	:	slow
beautiful	:	:	:	:	:	:	:	ugly
strong	:	:	:	:	:	:	:	weak
active	:	:	:	:	:	:	:	passive
valuable	:	:	:	:	:	:	:	worthless
heavy	:	:	:	:	:	:	:	light
hot	:	:	:	:	:	:	:	cold

Concept: IMMEDIATE REINFORCEMENT

good	:___:___:___:___:___:___:___:	bad
large	:___:___:___:___:___:___:___:	small
fast	:___:___:___:___:___:___:___:	slow
beautiful	:___:___:___:___:___:___:___:	ugly
strong	:___:___:___:___:___:___:___:	weak
active	:___:___:___:___:___:___:___:	passive
valuable	:___:___:___:___:___:___:___:	worthless
heavy	:___:___:___:___:___:___:___:	light
hot	:___:___:___:___:___:___:___:	cold

Concept: PSYCHOANALYTIC THERAPY

good	:___:___:___:___:___:___:___:	bad
large	:___:___:___:___:___:___:___:	small
fast	:___:___:___:___:___:___:___:	slow
beautiful	:___:___:___:___:___:___:___:	ugly
strong	:___:___:___:___:___:___:___:	weak
active	:___:___:___:___:___:___:___:	passive
valuable	:___:___:___:___:___:___:___:	worthless
heavy	:___:___:___:___:___:___:___:	light
hot	:___:___:___:___:___:___:___:	cold

Concept: POSITIVE REINFROCEMENT or REWARD

good	:	:	:	:	:	:	:	bad
large	:	:	:	:	:	:	:	small
fast	:	:	:	:	:	:	:	slow
beautiful	:	:	:	:	:	:	:	ugly
strong	:	:	:	:	:	:	:	weak
active	:	:	:	:	:	:	:	passive
valuable	:	:	:	:	:	:	:	worthless
heavy	:	:	:	:	:	:	:	light
hot	:	:	:	:	:	:	:	cold

Concept: ESTABLISHING RAPPORT

good	:	:	:	:	:	:	:	bad
large	:	:	:	:	:	:	:	small
fast	:	:	:	:	:	:	:	slow
beautiful	:	:	:	:	:	:	:	ugly
strong	:	:	:	:	:	:	:	weak
active	:	:	:	:	:	:	:	passive
valuable	:	:	:	:	:	:	:	worthless
heavy	:	:	:	:	:	:	:	light
hot	:	:	:	:	:	:	:	cold

Concept: CLIENT FEELINGS

good	:___:___:___:___:___:___:___:	bad
large	:___:___:___:___:___:___:___:	small
fast	:___:___:___:___:___:___:___:	slow
beautiful	:___:___:___:___:___:___:___:	ugly
strong	:___:___:___:___:___:___:___:	weak
active	:___:___:___:___:___:___:___:	passive
valuable	:___:___:___:___:___:___:___:	worthless
heavy	:___:___:___:___:___:___:___:	light
hot	:___:___:___:___:___:___:___:	cold

Concept: NON-DIRECTIVE THERAPY

good	:___:___:___:___:___:___:___:	bad
large	: __:___:___:___:___:___:___:	small
fast	:___:___:___:___:___:___:___:	slow
beautiful	:___:___:___:___:___:___:___:	ugly
strong	:___:___:___:___:___:___:___:	weak
active	:___:___:___:___:___:___:___:	passive
valuable	:___:___:___:___:___:___:___:	worthless
heavy	:___:___:___:___:___:___:___:	light
hot	:___:___:___:___:___:___:___:	cold

Concept: MODELING

good	:___:___:___:___:___:___:___:	bad
large	:___:___:___:___:___:___:___:	small
fast	:___:___:___:___:___:___:___:	slow
beautiful	:___:___:___:___:___:___:___:	ugly
strong	:___:___:___:___:___:___:___:	weak
active	:___:___:___:___:___:___:___:	passive
valuable	:___:___:___:___:___:___:___:	worthless
heavy	:___:___:___:___:___:___:___:	light
hot	:___:___:___:___:___:___:___:	cold

SURVEY OF KNOWLEDGE OF LEARNING THEORY
Videotape Research Project

Your name:_____ Date:_____

This test is being given for research purposes only. You will not be graded or evaluated on the basis of this test. We are simply interested in how much information the average clinician possesses about learning theory and operant therapy.

NOTE: In the following definitions, do not use examples to help define the concept. Try to describe it in your own words.

Define base rate.

Define partial reinforcement.

Define reinforcement schedule.

Define social reinforcement.

Define operant.

Define tangible reinforcement.

Define verbal reinforcement.

APPENDIX D

ACTIVITY	SOCIAL				TANGIBLE	
	Verbal		Non-Verbal			
	Pos	Neg	Pos	Neg	Pos	Neg
Nodding the head						
"Wrong"						
Smiling						
Giving an M&M						
"Good"						
"Right"						
Taking away a toy						
Shaking the head						
Allowing client to play with a puzzle						
Frowning						
Patting client on arm						
"Not very good"						

For each kind of activity listed above, check which kind of reinforcement you think it is. Check off only one type of reinforcement for each activity listed.

APPENDIX E

Changes in the Category Scoring System

At the conclusion of the 1969-70 study the ten-category system of scoring videotapes and audiotapes had been used by 40 trainee clinicians in addition to the investigators. Furthermore, formal and informal presentations have been made of the scoring system to other personnel in the field of speech therapy and related areas. Finally, Prescott (1970) developed an extended version of the category system. These efforts, when combined, have resulted in certain recommended changes in the system.

The most consistent problem has occurred over the use of the term "negative reinforcer". Ferster and Skinner (, p.) use the term as synonymous with an aversive stimulus, and it is also used in introductory works on behavior modividation (Wenrich, 1970). The problem is that a therapist providing a "negative reinforcer" is not engaged in "negative reinforcement". The latter phrase refers to the removal of an aversive stimulus in order to increase the response rate of a behavior. Because of this semantic tangle, the terminology of the category system will be changed so that Categories 3 and 4 will be:

Category 3. Positive Reinforcer or Reward. The reinforcer may be tangible such as a piece of candy or a toy; it may be verbal, such as the words "Good", "Yes", "Correct". It may also be nonverbal, using a nod, smile, or touch.

Category 4. Aversive Stimulus, Punisher, or Negative Reinforcer. Verbal aversive stimuli would include "No", "Wrong", "Bad". A frown or shake of the head would be a nonverbal aversive stimulus. Tangible aversive stimuli would include taking away a toy, restraining movement, or even slapping a child.

Using these definitions, the occurrence of positive or negative reinforcement reward schedules can be found by scoring a therapy session. Positive reinforcement would be the process of providing positive reinforcers contingent on a client behavior; that is, the occurrence of Category 3 after a specific kind of behavior. Negative reinforcement would be the process of stopping the occurrence of an aversive stimulus when a correct client behavior occurs. This would be seen as a string of Category 4 acts following neutral or incorrect behaviors and then the cessation of Category 4 acts when the client does domething right.

Conversely, punishment schedules would be defined as providing Category 4 acts contingent on incorrect behaviors or the cessation of Category 3 reinforcement contingent on incorrect behaviors.

The two categories, positive reinforcer and aversive stimulus, provide for a description of four reinforcement schedules:

1. positive reinforcement - reward
2. negative reinforcement - reward
3. punishment using contingent aversive stimuli
4. punishment using contingent withdrawal of positive reinforcers

Thus, the change will permit recording of all the possible reinforcement schedules.

The other possible change results from Prescott's work. By demonstrating that a system with as many as 19 categories can retain high reliability, Prescott has opened the possibility of more refined scoring procedures. At this time, the most promising area appears to be in the use of more categories for the description of eliciting techniques. Table 10 lists the categories Prescott studied, and the differentiation of various forms of modeling is evident in Categories 2, 3 and 4.

APPENDIX E

Table 10

Prescott Category System
for Scoring Videotapes

Category 1. Explain/describe

Category 2. Auditory model

Category 3. Visual model

Category 4. Auditory-visual model

Category 5. Positive reinforcer (tangible)

Category 6. Positive reinforcer (social-verbal)

Category 7. Positive reinforcer (social-nonverbal)

Category 8. No observable reinforcer

Category 9. Negative reinforcer (tangible)

Category 10. Negative reinforcer (social-verbal)

Category 11. Negative reinforcer (social-nonverbal)

Category 12. Neutral/social

Category 13. Correct response

Category 14. Incorrect response (approximation)

Category 15. Incorrect response

Category 16. Inappropriate response

Category 17. Positive self reinforcer

Category 18. Negative self reinforcer

Category 19. No response

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BIBLIOGRAPHY

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